ALCOHOLISM

A STUDY IN HEREDITY

BY G. ARCHIBALD REID

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ALCOHOLISM

A STUDY IN HEREDITY

BY

G. ARCHDALL REID, M.B., C.M., F.R.S.E.

AUTHOR OF

"THE PRESENT EVOLUTION OF MAN"

"A THEORY OF ACQUIRED IMMUNITY"

ETC., ETC.

LONDON

T. FISHER UNWIN

PATERNOSTER SQUARE

1901

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PREFACE

THE scope of the present work is scarcely so wide as that of the writer's "Present Evolution of Man." The author hopes he has profited by the criticism and advice which he received on the publication of his former work. Some preliminary discussion of the general problem of evolution has been necessary for the sake of the general reader, but as much as possible of the technical material has been banished to the Appendix. Thus, though both the preliminary statement (the first five chapters) and the Appendix are unusually long, as compared to the main body of the work, yet the way has been cleared for the full study of a particular field of thought and human endeavour. The fact that the preliminary statement contains a little that is new may reconcile the biologist to it. It is to be feared that nothing can reconcile the general reader to the Appendix. However,

if the reader be impatient, and especially if he have some slight acquaintance with modern biological thought, it is possible to take both the preliminary statement and the Appendix for granted, and confine the reading to the last nine chapters of the book.

It must be admitted that the selected field of thought is of great importance. It would be impossible to over-estimate the issues which hang upon latter-day human evolution — especially of all that has resulted from disease and from the use of narcotics. An attempt is made in this volume to trace the causes of intemperance on purely scientific lines, and to indicate a practical remedy. It is probable that the scientific data enunciated here, as well as the suggested remedy, will be denounced in general terms. But the writer challenges detailed criticism. If his opponents are able to break but a single link of the long chain of fact and argument, it will be sufficient. If, however, they limit themselves to epithets, his contention that "every scheme of temperance reform, hitherto enunciated, which depends upon

the diminution or extinction of the supply of alcohol — Total Prohibition, Local Option, the Gothenburg System, etc.—is, in effect, a scheme for the promotion of drunkenness," will not be destroyed.

The remedy suggested by the author may be impracticable at present. But it is the only real remedy, and Nature has found it practicable.

The writer thanks the Editors of *The Lancet*, *The Scottish Medical and Surgical Journal*, *Natural Science*, *The Medical Magazine*, and other periodicals, for permission to reproduce articles or parts of articles which have appeared in their journals. Portions of the present volume were utilized for a course of lectures on Heredity in the University of Edinburgh. Chapters III. and IV. originally appeared in *The Scottish Medical and Surgical Journal*, whence they have been adapted for the purposes of this work. The extracts from the evidence given before the Royal Commission on Opium were published in "The Present Evolution of Man." Appendix C is adapted from *The Lancet* and *The Scottish Medical*

and Surgical Journal. Appendix D is reprinted from *Science.* Appendix E was read before Section D of the British Association for the Advancement of Science at the Bristol Meeting. Subsequently it was published in *Natural Science*, December 1898. Appendices C and E have obvious bearings on the doctrines of this book. The latter merely re-affirms in more technical terms and in greater detail the doctrine laid down in Chapter V. Appendix D has a less obvious bearing, but is included to prove that Social and Moral Evolution—concerning which so much has been written of late—are myths, from the biological point of view, and that the only real evolution Man is undergoing is that indicated in the body of the work.

The writer ventures to call the reader's attention to Appendix M. It is the Report of a *Research Committee*, appointed by *The Society for the Study and Cure of Inebriety*, "to consider the conditions under which a tendency to inebriety is transmitted from parent to offspring." The membership of this Society is limited to medical men, but

lay associates are admitted. To the best of the writer's knowledge, it is the only Society within the kingdom that studies inebriety on scientific lines.

The Author's thanks are due to Dr A. F. R. Platt, who compiled Appendix A, and to Dr Laing Gordon for counsel and assistance in preparation of the volume.

SOUTHSEA, 1*st August* 1901.

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A STUDY IN HEREDITY

CHAPTER I

EVOLUTION

The antiquity of drinking habits—Inebriety a problem of evolution—Proof of evolution—Evolution implied in all creeds—Enough for the purposes of this work.

At a period extremely remote in human history, and in an evil hour, the discovery was made that fermented liquors were capable of inducing pleasant sensations. At the same time, or shortly afterwards, it was doubtless observed that deep drinkers purchased their short-lived pleasure at heavy expense in health and happiness, and that through them the well-being of the community suffered. As a consequence, from a period also extremely remote, historically for some fifty centuries,[1] punishments have been inflicted on drunkards, and attempts have been made to diminish or abolish the consumption of alcohol—with the

[1] *Vide* Appendix A.

result that the use of that poison is now more general and widespread on the surface of the globe than at any former period. But fifty centuries and more of known failure have not yet disheartened temperance reformers; and still, as in years long past, we are urged by them to seek a remedy in coercive measures, the futility of which has been proved a thousand times.

Temperance reformers have been actuated almost invariably by religious or philanthropic motives. Seldom has the problem been approached from a scientific standpoint, and then only by observing the effects of alcohol on the individual. But, since a craving for alcohol of greater or lesser depth is readily awakened in most men, and since different races of men, Spaniards and American Indians for instance, differ vastly in respect to the depths of their desires for indulgence, it is plainly important to ascertain the origin of this craving, and in particular the causes which have rendered some races more or less inclined to excessive indulgence than others. In other words, it is plainly important to study the effect of alcohol, not only on the individual but also on the race. The problem then becomes one for the evolutionist; and when he has ascertained why Spaniards, for example, are less prone to deep indulgence than Englishmen, and *à fortiori* than American Indians, we may, by following the path that Nature

herself has marked out, find the source of our former failures, and, perhaps, even achieve some measure of real success in temperance reform in the future.

It is the fashion to speak of evolution as of scientific interest, but as having no immediate bearing on the present-day problems of humanity. Indeed, some writers appear to think that the evolution of man has ceased; they tell us that, judging by ancient monuments, no race appears to have undergone appreciable change for thousands of years. Others think the processes of evolution so slow as not to come within the range of practical politics. If, however, the reader will have patience, I think I shall supply him with reasons for arriving at a contrary conclusion. Man is changing very swiftly at the present time. Owing to great and rapid changes in his environment, he is evolving at a rate far more speedy than at any former period of his existence; but in a direction not suspected by the writers I have indicated.

Speaking practically, the doctrine of evolution is not now questioned by any one acquainted with the facts on which it is founded. So vast is the evidence in its favour afforded by every science which deals with life—zoology, botany, comparative anatomy, embryology, palæontology, and the rest—that the immense majority of scientific men are as thoroughly convinced of its truth as they are of the fact that the

world is round. It is no longer considered by them as an interesting guess, a mere hypothesis, a thing that may be doubted. It is regarded as a proven and accepted fact. But scientific belief filters downwards very slowly. Nearly four hundred years have elapsed since the Copernican doctrine of the spherical shape of the world and of its revolution round the sun was first enunciated, and to this day there are doubters even among the most civilised peoples. The theory of evolution was brought prominently before the world scarce forty years ago ; its progress has been much more rapid than the Copernican theory, for, as I say, it is already accepted by almost the whole of the educated world ; but, as is natural, the masses still reject it. At least they reject it nominally. Really I suppose no sane human being in existence doubts it. All that objectors usually do is to set limits to its operations, which vary with the extent of their knowledge. Thus, while many men decline the doctrine that all species of plants and animals had a common origin, all men, even the most savage, believe that the different races of mankind sprang in the far distant past from a common stock—Heathen Gods, Adam and Eve, a species of lower animals ; it matters not which. But to-day the different races differ vastly. Some are white, others black, yellow, or copper-coloured. Some are big, others are small. Some have long

straight hair ; the hair of others is short and woolly. And everywhere Nature has adapted every race to its particular environment. The Negro flourishes in West Africa, where the Englishman perishes. The Negro dies almost as surely in London. The Esquimau and the naked Tierra Del Fuegian are able to endure extremes of cold. The native of India sits unharmed with bare shaven head in the full glare of the tropic sun. By their big brains Europeans and some Asiatics are fitted for the complex conditions of civilised life ; simpler, but not less stringent conditions, have developed to an extraordinary degree the senses, the sight, smell, hearing, of Australian Aborigines.

It is not possible, then, for any sane human being to doubt evolution. In particular, it is not possible for the orthodox Christian, who derives the human races from Adam and Eve, to doubt it. Such a one must admit also that evolution may be very rapid since, according to him, six or seven thousand years only have sufficed to produce types so widely divergent as the Scandinavian and the African Pigmy. That evolution is very rapid may be proved beyond doubt by a study of our cultivated plants and domesticated animals. A very few generations only separate some of our most highly modified garden and orchard plants from their wild congeners. The evolution of our prize breeds

of animals has been slower; nevertheless, many breeders, within the short span of the working life, have produced great changes in different species and varieties. It will doubtless be objected that man is different from Nature: that man selects with care while Nature does not. But presently I shall show that in all the races of mankind Nature is selecting certain types of men for survival, for procreation, with a stringency so extreme that, while no race escapes decimation, some races are undergoing extermination.

For the purposes of this work it matters not whether my readers subscribe to the doctrine of evolution in its totality—whether they hold the belief that all plants and animals had a common origin. If they admit, as admit they must, that races of plants and animals change somewhat under altered surroundings, it is sufficient. We can then start from a common basis, and have a hope that a dispassionate consideration of evidence will lead us to a common conclusion. All that can then be in dispute between us is that which is still in dispute to some extent among scientific men; namely, the method by which evolution works, the method by which living species undergo change.

CHAPTER II

THE METHOD OF EVOLUTION

The two rival doctrines — Characters, inborn and acquired — Lamarck's theory — Darwin's theory — Illustrations of the two theories—The complexity of Lamarck's doctrine—The simplicity of Darwin's — Limits within which Natural Selection works—Reasons for rejecting Lamarck's doctrine — Acquired characters not transmissible — Proofs drawn from the body and mind of man.

EVOLUTION is said to occur when a species undergoes a progressive and adaptive change; as for example when, during the course of generations, the wings of a species of bird grow stronger, larger, and better adapted for flight. During this process it is plain that succeeding generations must, in succession, become superior to those which preceded them. The whole problem of evolution hinges on the question: In what way is this improvement effected? By what method?

Only two theories of evolution are possible, or even thinkable. All other theories, of which several have been enunciated, are, from the nature of the

case, mere variations of those two.[1] Lamarck, because he first formally enunciated it, gave his name to the one theory; Darwin, for the same reason, gave his to the other. We have seen that all men have, within limits, a belief in evolution. It is curious that during every age they have accepted as a belief the method of evolution laid down by Lamarck, but have followed as a practice that laid down by Darwin. In other words, they have believed that races change in the manner described by Lamarck, but have sought to improve their own plants and animals in the manner described by Darwin.

The two theories can be explained best by illustrations drawn from the animal world, but first it is necessary to define two important terms. All the characters of a living being, every physical structure and every mental trait, may be placed in one of two categories. Either they are *inborn*, or they are *acquired*.[2] An inborn or innate character

[1] Evolution must proceed by the transmission of inborn traits, or of acquired traits, from parent to child, and by their accentuation during succeeding generations. Even if we regard the course of evolution as designed and predestined, no other method is thinkable, because no traits other than the inborn and the acquired exist in living beings.

[2] It should be observed that the word "acquired" is a technical biological term, which has a very precise and restricted meaning. It can be applied only to individuals as such, never to races or species as such. Thus, if it were stated that, during its evolution, the negro *race* acquired woolly hair, the term would not be used in its strict

is one which, in common parlance, arises in the individual "by nature." Thus arms, legs, eyes, ears, head, etc., are all inborn characters. The child inherits them from his parent. But, if during its development, or after the completion of the development, any one of the inborn characters of an individual is *modified* by some occurrence, the change thus produced is known as an acquired character, or, shortly, as an acquirement. Thus all the effects of exercise are acquirements; for example, the enlargement which exercise causes in muscles. The effects of lack of exercise are also acquirements, for example, the wasting of a disused muscle. The effects of injury are acquirements, for example, the changes in a diseased lung or injured arm. Every modification of the mind is also an acquirement, for example, everything stored within the memory. If a man be blinded by accident or disease, his blindness is acquired. But if he come into the world blind, if he be blind by nature, his blindness is inborn. If a son be naturally smaller than his father, then his inferiority of size is inborn; but if his growth be stunted by ill-health or lack of nourishment or exercise, his inferiority is acquired.

biological meaning. The woolliness of the hair of negroes was presumably inborn from the very beginning. But, if *a man* by some process changed his straight hair to wool, the woolliness would, in that case, be an acquirement.

Inborn characters are known to be transmissible from parent to offspring. Thus the parent transmits arms, legs, eyes, and his other inborn characters. Even when an inborn character appears for the first time in a family it tends to be transmitted. For example, a man born blind tends to have blind children; a man born with six fingers tends to perpetuate his peculiarity. Lamarck held, as people in all ages have held, that characters acquired by parents are also transmissible to some extent, and that evolution results from their accentuation during succeeding generations. Lamarck's theory is rejected totally by the modern followers of Darwin. They deny that acquirements are ever transmitted from parent to offspring, and assign quite a different cause for evolution. Even at the cost of some repetition, it is worth our while to dwell a little on this point. When it is understood, the rest of this essay will present few difficulties.

If, as Lamarck alleged, a child inherits his father's acquirement, it must follow that he differs from his father in that he has inborn the peculiarity which the parent acquired. He differs at birth from what his father was at birth. He therefore makes a different start in life. Suppose, for instance, an athlete developed his muscles to an abnormal degree by taking more than a normal

amount of exercise. Then, if the child of this man inherited his father's muscular acquirement, he would develop the abnormal muscles without taking the more than normal exercise. He would start from a position of advantage; and, if he adopted his father's training, he would develop his muscles to an extent exceeding his father's muscular development. Obviously, if this process were repeated for many generations, it would result in great evolution. When a child differs innately from his parent, the difference is termed by biologists a *variation*. Lamarck, then, believed that variations arise through the transmission of parental acquirements to the child, and that evolution results from the repetition of this process during succeeding generations.

But, even if Lamarck were right, even if the transmission of acquirements be admitted, it is still certain that all inborn differences between parent and child cannot be attributed to this cause. For instance, a child may be born with peculiarities of which the parent had never a trace, for example, a mole on the face. The child of a natural athlete, who has trained himself to the point of perfection, may be a natural weakling. The child of a sedentary parent may have in him the makings of an athlete. Most convincing fact of all, the members of a litter of puppies often differ greatly:

were parental acquirements the sole causes of variations in the offspring, the puppies would, from the nature of the case, be all exactly alike, for they would all inherit the same acquirements. It is clear, therefore, that offspring may be superior or inferior to their parents, as regards any particular, from causes other than the transmission of acquirements. On that indubitable fact Darwin founded his theory of evolution.

Darwin accepted Lamarck's theory so far as it went. He agreed that acquirements were transmissible, and, therefore, a cause of evolution. But he thought that variations produced otherwise than by the transmission of acquirements—accidental variations as in our present ignorance we may call them—were also causes of evolution. He thought that Nature, like the breeder, selected to continue the race individuals who were "accidentally" superior, while she eliminated the "accidentally" inferior. The world has progressed since Darwin's day. A new school has arisen which out-Herods Herod. His modern followers, the Neo-Darwinians, declare that Darwin, with characteristic modesty, underrated his own great discovery. They insist that Lamarck was wholly wrong, that acquired characters are never transmitted, and that therefore Darwin's theory, instead of only partially explaining the facts of evolution, wholly explains

them. They have theories as to how variations arise.[1] But we need not pause to consider them. They are not relevant to our inquiry. The essential fact is that Neo-Darwinians strenuously deny that variations arise in the manner laid down by Lamarck; in other words, they strenuously deny the transmission of acquired traits. The reader will note that Darwin merely accepted the indubitable fact that offspring differ from their parents in that they are superior or inferior, and founded his theory on the supposition that, as a general rule, the superior individuals are selected by Nature to continue the race. He did not attempt by his theory to explain how the differences arose.[2] Lamarck did more. He attempted to go deeper than Darwin. He assigned a particular cause for the differences. He supposed that parents transmitted their acquirements to offspring, and, on that supposition, founded his theory of evolution.

Let us now return to our illustrations. The followers of Lamarck attribute the long neck of the modern giraffe to the transmitted effects of stretching. They think that ancestral giraffes lengthened their necks by stretching upwards, and

[1] *Vide* Appendix B.

[2] At any rate, the attempt is not implied in his theory of Natural Selection. He did attempt it in his theory of Pangenesis, and failed more dismally than Lamarck.

that this acquirement, being transmitted and increased in subsequent generations, resulted in evolution. Neo-Darwinians, on the other hand, contend that the change was due solely to the survival of those individuals which had naturally the longer necks. They suppose that in times of drought, when food was scarce, the shorter giraffes perished, because they were less able than the taller to reach the higher leaves of trees. The taller thus alone continued the race, and this process, repeated during long ages and many generations, resulted in the long neck of the modern animal. Lamarckians believe that hares run swiftly because their efforts at swift running developed the appropriate structures, and this improvement, transmitted and increased generation after generation, resulted at last in that very swift animal the modern hare. Neo-Darwinians contend that the great speed of hares is due to the fact that those animals who were naturally the swiftest escaped their enemies, and that by this means, during the process of ages, was the swift modern hare evolved. Say they, all animals other than giraffes also stretched upwards for food, yet their necks did not grow long; all animals other than hares strove to run fast, yet they did not become so speedy. On the contrary, their survival was secured by evolving in other directions. Lamarckians assert, but Neo-Darwinians

deny, that the child of him who does hard manual labour tends to have at birth thicker skin in the palms than the child of him who labours only with his brains. Neo-Darwinians say that a naturally tall man tends to have tall children, but that, no matter how a man is stretched or how he stretches himself, his children will not be the taller in the smallest degree for the stretching; Lamarckians affirm that they will. Lamarckians maintain that if a blacksmith increases the size of his muscles by labour his children will thereby profit, and have stronger muscles than they would otherwise have had. Neo-Darwinians deny this. Lamarckians affirm that if a man develops his brains by study his children will have better brains for this process. This again Neo-Darwinians deny. Lamarckians maintain that if a man has children, and then, after falling into ill-health, has more children, the latter will be more feeble than the former. This yet again is denied by Neo-Darwinians.

Examined closely, it will be seen that the two theories are violently opposed. If the Lamarckian doctrine were true, evolution would be determined solely by beneficial agencies, such as good food and proper exercise. Injurious agencies would cause racial degeneration and ultimate extinction. On the other hand, the Neo-Darwinian doctrine attributes evolution entirely to injurious agencies,

and to these only when they operate under certain conditions. They must be selective; that is, they must discriminate between the fit and the unfit, between the superior and the inferior. Under their action individuals of a certain type, the fittest, who excel in a particular quality or set of qualities, must generally survive to continue the race, while the rest of the species in large measure perish. It follows, if an injurious agency is so little injurious as not to influence the death- (or birth-) rate, or so very injurious as not to discriminate between the fit and the unfit, that it cannot be a cause of evolution. In the one case the unfit are not eliminated; in the other the fit do not survive. Haphazard deaths again are not causes of evolution. Thus fire and water may destroy many lives in this country, but they do not select for survival any particular type of individual.

No breeder of plants and animals is able to improve his stock unless he breeds with care, unless he exercises stringent selection. Race-horses, for example, could not have been evolved by the occasional elimination of an inferior animal. All or most inferior animals had to be eliminated. It follows that a breeder cannot at one and the same time improve a species in every or even in many directions; he must be content with improvement in a very few particulars only. If he sought im-

provement in many directions, in size, in strength, in speed, in endurance and hardiness, in beauty of colour and form, in sight, in scent, in hearing, and so forth, so few animals would be excellent at once in all these particulars that if he attempted selection in all, he would exterminate rather than improve his stock. He, therefore, deals with a few characters only, and as regards all other characters eliminates only such animals as are plainly inferior to the average. If the Neo-Darwinian doctrine be true, the same thing must occur in Nature. In that case wild plants and animals could not undergo evolution in many directions at the same time. It may be argued that the higher plants and animals are very complex, and that all their thousand parts must all have undergone evolution. This is true; they have certainly all undergone evolution, but not all at the same time. For thousands of years the eyes, the ears, the hands, the feet, and very many of the other characters of man, for instance, have undergone no appreciable evolution. They were evolved during different but overlapping periods of a long extended past. It follows, then, that the Darwinian scheme of evolution presents us with problems of comparative simplicity. According to it, evolution results from the selective elimination of inferior individuals, and then only when the selective elimination is considerable in volume. And, since considerable

evolution cannot result in many directions without exterminating the species, evolution during given time is limited to but a few directions. We have, therefore, only to note the principal causes of the death-rate to discover the actual lines of evolution.

The Lamarckian doctrine is very different. According to it, every beneficial agency, acting on a species, causes evolution; every injurious agency degeneration; and, therefore, evolution proceeds in the higher plants and animals on lines of enormous complexity. Here again the Lamarckian and the Neo-Darwinian doctrines are in violent contrast.

I have said that no sane man can doubt the reality of evolution. We may now go further and declare that it is not possible for any sane man to withhold a limited adherence to Darwin's explanation of it. The proofs furnished by breeders are too conclusive. It is quite beyond dispute that offspring differ innately from their parents, that these innate differences, these "variations," are transmissible to descendants, and that, if advantage be taken of them by selecting for breeding purposes the superior individuals, while the rest are eliminated, evolution will result. The only point we have yet to prove is that Nature like the breeder exercises the necessary selection. At first sight Lamarck's doctrine also seems true. Thus it appears only

reasonable to suppose that the children of a man fallen ill will be the weaker in consequence of his acquired feebleness, or that the children of a man made hard and strong by exercise will be the stronger for his improved health. Nevertheless, during the last twenty years a vast mass of evidence has been collected, which, in the opinion of most thinkers acquainted with the facts, absolutely disproves this assumption. The Lamarckian school is rapidly becoming extinct in the scientific world. It flourishes, however, among the general public, who, though they may never have heard of Lamarck, give to his theory unquestioning adherence.

Probably many of my non-biological readers are now thinking of instances within their knowledge which they believe prove the transmission of acquired characters. But let me repeat that though for years this problem has engaged the unremitting attention of many of the acutest and best-instructed intellects in the world, that though the battle on this question has raged everywhere—in Europe, in America, in Australia, in Japan—that though the whole plant and animal kingdoms have been ransacked, yet no single indisputable instance of the transmission of an acquirement has been proved. This is not the place in which to discuss the physiological bearings of the question, but, in fact, there is no way in which acquirements could be

transmitted.[1] Did transmission occur, it would be a magical act transcending everything we know of Nature. All those cases of alleged transmission, of which readers are perhaps thinking, are, I venture to believe, mere coincidences. Thus, for instance, if they are thinking of some man they have heard of who broke a finger and afterwards had a son with a crooked finger; or of a woman who saw a person with a hare-lip, and afterwards bore a child with a hare-lip,[2] they are certainly thinking of mere coincidences. Ten thousand men might break their fingers, yet among their offspring not one might have a crooked finger. All women see hare-lips, yet, comparatively speaking, hare-lips are rare. Consider on the other hand for how many generations women have bored their ears and noses (in India). Yet when is a girl born

[1] *Vide* Appendix C.

[2] This is an example of what is known as the *transmission of a maternal impression.* A pregnant woman sees a deformity or something else, which powerfully impresses her. Her child, when born, is supposed to reproduce the deformity. *Telegony* is a phenomenon of much the same order. A mother, who has borne offspring to one sire, is supposed to so influence offspring borne to subsequent sires that these latter reproduce the peculiarities of her first mate; thus a white woman who has borne a child to a negro is supposed ever after to bear dark children to white men. In the one case the mother's mind is thought to be impressed; in the other case her body. Both hypotheses furnish examples of the amazing looseness of thought which occasionally prevails in biological writings. Neither the transmission of maternal impressions nor telegony has stood the test of accurate observation; they are popular superstitions. But suppose they had been demonstrated up to the hilt; even in that case, the

with ears and nose ready pierced. For how many generations have we amputated the tails of terriers, and yet their tails are no shorter. Moreover, were such instances of hare-lips and crooked fingers as I have just indicated real cases of transmission, and not of coincidence, we must still remember that one swallow does not make a summer; such instances would be too far and few between to influence the problem we have under discussion—to influence the course of evolution. In judging of this question we must not think, as is the popular habit, of rare and isolated cases, which, with practical certainty, may be attributed to coincidence, but only to what ordinarily happens. It will then be perceived how overwhelming is the case against the doctrine of the transmission of acquirements.

The general question of the transmission of acquirements is too big and too abstruse to be

transmission of acquirements would not have been proved; for by the transmission of acquirements we mean, or ought to mean, that the precise thing the parent acquired, or something like it, is transmitted to offspring. But a mother who gets a mental impression does not transmit that mental impression to her child; on the contrary, the child is supposed to develop something quite different, a physical malformation. So, also, did the white mother of a half-breed bear dark children to a white father, she would not transmit anything she acquired, for intercourse with a negro does not make *her* dark. Telegony and the transmission of maternal impressions therefore cannot furnish arguments for the Lamarckian doctrine. Were they true, they would merely furnish arguments for the very reasonable doctrine that changes in the parental mind or body may, in this or that *other* way, affect children subsequently born—a very different thing from the doctrine of the transmission of acquired characters.

treated adequately here. Two arguments more I may use, however, partly because they have not been developed, to my knowledge, by other writers, and partly because they seem to me well-nigh decisive. The more than normal development of the blacksmith's arm is rightly called an acquired trait, since it arises from exercise, from use, not from germinal conditions. But no infant's arm develops into an ordinary adult arm without exercise similar in kind to that which develops the blacksmith's arm, though less in degree. Without the exercise, as when paralysed, it remains more or less infantile. Therefore, almost all that separates the infantile from the adult arm is acquired. The same is true of most of the other structures of the body, which do not develop except under the stimulation of use. Thus brain, heart, lungs, legs, all develop in this manner. Man's physical acquirements are therefore vast. When are any of them transmitted? Every infant has to make afresh under similar stimulation the modifications its parent so laboriously acquired. If it be argued that exercise and use increase, not only the individual's acquirements, but also his power of making them, and that it is the latter that is transmitted, I have only to reply that, in the passage from infancy to old age, the power of making acquirements constantly declines. In the

infant it is at a maximum; hence his development into adult man. In the old man it is at a minimum; it is almost lost. When nothing is acquired no acquirement can be transmitted. The same arguments apply to mind. At birth the infant's mind is a blank. His subsequent mental acquirements are immense. Every single thing contained within the memory of man, every single word of a language, for instance, is an acquirement. But when are the contents of a parent's mind transmitted to the child?

Again, a man is capable of becoming a parent at any time between extreme youth and extreme old age; a woman from the age of thirteen or fourteen till nearly fifty. Between the birth of the first child and the last such an individual changes vastly. Under stress and tear of circumstances, under the slings and arrows of outrageous fortune, all sorts of acquirements are made. The body becomes vigorous, and then feeble; the mind grows mature, and then senile. He or she grows wrinkled and bowed, and perhaps very wise, or perhaps much the reverse. Yet no one viewing a baby show, a children's party, or an assembly of adults, of whom he has no previous knowledge, can say which is the child of the youthful and which of aged parents. Apparently, therefore, the whole of the parent's acquirements have no effect on the child. Surely no evidence could be stronger.

CHAPTER III

THE NATURAL HISTORY OF MAN

Objections to the doctrine of Natural Selection—The impossibility of proving Natural Selection by a study of wild Nature—Man no longer evolves along ancient lines—Social and moral evolution a myth from a biological standpoint—Proof of the actuality of Natural Selection obtainable from the study of human death-rates—Zymotic disease the principal cause of human elimination—"Parasitic" and "saprophytic" diseases—Evolution against disease—Acquired and inborn immunity—Acquired effects of disease not transmissible to offspring.

It is admitted by nearly every student of the question that Darwin's exposition of the method of evolution is correct. But a diminishing remnant, among whom, however, are still some eminent thinkers and men of science, are as yet malcontent. Their objections are twofold. Some of them assert that acquired characters are transmissible, and that therefore Darwin's theory does not explain the whole facts of evolution. With that objection we have just dealt, and will have occasion to deal again and yet again. The second objection is more subtle, and therefore less easy to meet. The objectors admit that, by following

Darwin's method, breeders have altered many species of plants and animals almost at will; but they deny that Nature, like the breeder, exercises selection. Nature, they say, is blind, and works at haphazard; she does not exercise any real selection. There is in fact, they say, no such thing as Natural Selection; only a conscious agent like Man or the Deity can exercise selection. Objectors of this school, who are not often men of science, forgetting the changes the different races of mankind have undergone, usually deny the existence of all evolution in the natural world. According to them, evolution is limited to changes consciously caused by man.

As a fact, it is most difficult to prove that selection does occur among wild plants and animals. We have not a sufficiently intimate knowledge of their lives. We cannot, in accurate statistics, tabulate their death-rates. We cannot declare, with certainty, that this or that type of individual survives as a rule, and that this or that type, as a rule, perishes. We cannot, from intimate knowledge, declare that the possession of this or that character *in excelsis* conduces to survival, and this or that other character to elimination. Our commonest wild plant is the grass. No one has tabulated the death-rate of grass plants, or can pretend to do more than guess at the principal causes of their elimination. Our com-

monest wild animal of any size is the sparrow. No one has tabulated the death-rate of sparrows. Not even one wild sparrow, that has escaped the dangers of the nest, has had its career followed from birth to finish. The nature of the case forbids accurate observation. It is therefore not easy to refute the contention that Nature does not exercise selection among wild plants and animals. We may be sure, on grounds of common-sense, that Natural Selection is a potent force in the world, but the materials of proof have hitherto been wanting.

But one animal, however, has been overlooked in a very amazing way by inquirers—the animal best known to all men—man himself. In a past which is becoming remote over by far the greater part of the world, man's survival depended mainly on strength, activity, endurance, mental receptivity, and the like. But the conditions have changed. Civilised men do not perish in great numbers of privation or violence. In any case violence and privation are no longer selective. The man who perishes of hunger is not necessarily the least capable of enduring it, nor the least capable of providing food. The inferior man, born to superior wealth or education, has a better chance than the superior man born to comparative poverty. Lyddite shells and Mauser bullets fired "into

the brown" at distances of a mile or more do not discriminate between the weak and the strong, as did the hatchet and the club.

Social evolution and moral evolution, about which so much has been written of late, are myths from the biological point of view. They have not arisen through the survival of the fittest. Men adhere to a particular state of society or morals, not through nature, but through education. The child of a Quaker, when reared by savages, is an utter savage, and *vice versa*. That which can be acquired or lost in a single generation is not a part of evolution. The savage differs from the civilised man merely in education; he is provided with a different set of mental acquirements, that is all.[1]

It seems, then, that evolution along the ancient lines has ceased. The race is no longer necessarily to the swift, nor the battle to the strong. But the mill has not ceased to grind. Men still perish in enormous numbers, both during and before the procreating age, while yet capable of influencing posterity through heredity. A great agent of elimination is in operation, which is selective to a degree of accuracy far higher than the agencies which evolved man from the brute, or which differentiated his various races. To-day, under normal circumstances, civilised men perish almost

[1] *See* Appendix D.

exclusively of disease, and chiefly of zymotic disease —that is, disease due to the agency of those minute living organisms known as microbes. Measles and consumption are examples. In most countries zymotic diseases are so prevalent that no man escapes infection unless he be immune, nor death unless he be resistant.

Zymotic diseases may be divided into two classes, which shade into each other. The first class includes those diseases of which the microbes have their habitation entirely or principally in the human body; the second class those of which the microbes inhabit principally the environment outside the human body, and to which a human prey is not necessary. Contagious diseases are examples of the first class; their microbes inhabit wholly the human body, being communicable by a sufferer to another person by direct contact only. They are, therefore, wholly parasitic, and parasitic on man alone. Malaria is an example of the second class; a human prey is not necessary to the microbes, which are abundant in many deserted and sparsely inhabited tracts, and are therefore largely saprophytic.[1] Between the two extremes, between

[1] To avoid circumlocution, I use the word *saprophytic*, as meaning merely that the microbes are capable of existence for an indefinite period outside the human body. Properly speaking, a saprophyte draws its nutriment from dead organic matter, a parasite from a living being. Of course, therefore, the microbe of malaria is parasitic while

the wholly parasitic and the mainly saprophytic diseases, are a number of other zymotic diseases which resemble contagious diseases on the one hand, or malaria on the other, with respect to the incapacity, or capacity, of their microbes to exist apart from the human body. The microbes of measles, consumption, chicken pox, scarlatina, small-pox, influenza, etc., are all earth- or air-borne. They are not communicated by direct contact, and can therefore exist, at least for a limited time, away from the human body; but apparently they cannot multiply in the outside world. The microbes of cholera, enteric and yellow fevers, and some other complaints, chiefly water-borne, are able not only to exist outside the human body, but apparently can increase and multiply away from it. But they cannot thus multiply to an indefinite extent—at any rate, they cannot to an indefinite extent multiply away from water polluted by human filth, for travellers in countries void of human inhabitants are not infected by them. They are saprophytic to a very limited extent only.

it inhabits man. Dr Patrick Manson, whose researches in malaria have been epoch-making, believes it is always parasitic. He thinks it inhabits only man and the mosquito, passing from one to the other and back again. It would be irrelevant to discuss the question here, but I have given my reasons for dissenting from him elsewhere (*Physician and Surgeon*, 12th April 1900). The important point for us to note is that, *from whatever cause*, malaria is confined to certain localities.

Accordingly, as diseases resemble in type contagious diseases or malaria, locality is of little or of much importance. Contagious diseases, since they inhabit only the human body, are not affected by locality, and therefore have travelled everywhere, and are now of world-wide distribution. In this they are resembled by consumption, measles, and other earth- and air-borne diseases. Cholera, yellow-fever, etc., because more dependent on the outside world, are of more local distribution. Malaria, which is entirely dependent on the outside world, is strictly local; it does not travel the world over, but infests certain well defined districts.

As we have seen, men differ from—are superior or inferior to—their parents and fellows in every respect—in size, in strength, in colour, etc., but, as a rule, they resemble their parents more than they do other men. Thus fair men tend to have fair children, big men to have big children, and so forth. It is a matter of common knowledge that men differ in their powers of resisting this or that disease. Some men take a disease and perish; others take it and recover; yet others do not take the disease at all, they are totally immune. It is also a matter of common knowledge that every prevalent disease tends to afflict certain families more than it does others; in other words, parents

weak or strong against any given disease, tend to transmit their peculiarities to children. For this reason consumption, for example, is said to run in families. Three facts, therefore, are apparent: (1) that men differ in their powers of resisting any given disease; (2) that offspring tend to inherit their parents' powers of resistance; (3) that disease is highly selective in its action. It follows that every deadly and prevalent zymotic disease plays the part of a breeder. It eliminates the unfittest, leaving the fittest to continue the race. Thus, in the case of man, the only animal with whose conditions we are thoroughly familiar, we find the thing which has been denied so often, Natural Selection in full swing—Natural Selection of the most stringent kind, for, as I say, many death-dealing diseases are so prevalent within their areas of distribution that no man escapes infection unless he be immune, nor death, unless he be resistant. Here then is a test case. If there be truth in the Darwinian doctrine, disease should be a great cause of evolution.

It is most significant that every race is resistant to every deadly disease strictly in proportion to its past experience of it. West African negroes are much more resistant to malaria than Englishmen, who, on the other hand, are as highly resistant to consumption when compared to Australian blacks.

Englishmen and Polynesians, when immigrants in countries where malaria, typhoid, or dysentery are very rife, suffer much more than the native inhabitants. When small-pox, measles, consumption, syphilis, scarlatina, plague, or yellow fever overpass their normal boundaries, and attack the inhabitants of countries where they were previously unknown, they are destructive to a very unusual degree, as in Polynesia. Vaccination has been proved to be a very mild form of small-pox. For centuries, and, until very recently, we were scourged by small-pox; to the Esquimaux it was unknown. Most of us are able to recover even from small-pox; the Esquimaux perish even from vaccinia.[1]

Clearly the different races of mankind have undergone evolution against disease — this race against this disease and that race against that disease. In a vague way the evolution has been noted by philosophically-minded medical men. They have not called it evolution, but they have observed that races which have been much afflicted by any disease are stronger against it than races that have been less, or not at all afflicted. But, invariably, medical men have attributed the growth of powers of resistance to the transmission of

[1] Dr William Russell, *Scottish Medical and Surgical Journal*, April 1900, p. 330.

acquired traits. One attack of many diseases protects against subsequent attacks of the same disease. Thus, he who has recovered from an attack of measles or whooping-cough, chicken-pox, small-pox, scarlatina, plague, cholera, etc., is very much less liable than he was before his illness to take the complaint. Medical men have thought some of this immunity, this increased resisting power, has been transmitted by parents to offspring, and that thus, during the lapse of generations, the power of resistance has grown in the races afflicted. At first sight, therefore, disease does not seem to afford conclusive evidence against the Lamarckian doctrine.

Examined more closely, disease affords evidence which is absolutely conclusive. If ever an acquired character is transmitted, one would expect acquired immunity to be that character. It affects not merely this or that organ, or this or that structure, but the whole body. The entire organism undergoes a profound change. Before infection and recovery a man is capable of affording shelter and nutrition to millions of microbes. Experience of, and recovery from, a disease so alters him that his body becomes poisonous to that particular species of microbe. They perish in him; and as a rule this profound change of constitution endures for the rest of his life. If, then, it can be proved that acquired

immunity is not transmissible, it becomes very improbable that other acquirements, which merely affect the mind (brain), or the lungs, or arms, or legs, or any other local structure, are transmissible. It is worth while to put the question clearly, even at the cost of a little repetition, which will not matter if clarity of conception be gained thereby If, as is alleged by most medical men, the effects of disease are transmissible, then their effects must accumulate generation after generation. The son must start with the parent's constitution *plus* the effects of the parent's disease, the grandson must start with the son's constitution *plus* the effects of the son's disease, and so on. It is plain on this hypothesis that a race afflicted by any disease should undergo evolution or degeneration—evolution if the disease tends to strengthen the individual against subsequent attacks by conferring immunity, degeneration if it tends to weaken him. On the other hand, if the effects are not transmissible, then a race afflicted by deadly disease would change equally, would undergo evolution equally—but not degeneration. For men differ individually in their inborn power of resisting disease. Deadly disease is therefore a selective agency. It weeds out the less resistant to it, leaving the race to the more resistant. Therefore, on this other, this Darwinian hypothesis, a race afflicted by a disease should grow more and

more resistant to it. Moreover, since resisting power against one disease does not imply resisting power against any other, for example, since resisting power against consumption does not imply resisting power against malaria, every race should grow resistant only against the particular death-dealing diseases by which it is afflicted.

Now there are some diseases, of which consumption is an example, against which no resisting powers can be acquired. One attack of consumption, the most death-dealing of all diseases, weakens rather than strengthens, against subsequent attacks. If, therefore, the acquired effects of disease were transmissible, races afflicted by tuberculosis should grow less and less resistant to it. The exact opposite is true. For very many centuries consumption has ravaged the Old World, especially such crowded parts of it as England. But Englishmen now increase and multiply in cities and towns, the natural breeding-places of consumption; whereas, under like conditions, the inhabitants of the New World, where consumption was unknown until recently, perish. When infected with consumption by white men they tend to extinction everywhere, even in rural districts. Plainly there has been great evolution, but as plainly it has resulted solely from the survival of the fittest, not in the least from the transmission of acquirements. On the other hand,

there are some diseases against which immunity may be acquired, but which, though prevalent, are not deadly. Chicken-pox is an example. Against it no evolution is observable, for chicken-pox is neither more nor less severe in type when attacking Englishmen than when attacking Polynesians. In this case, in the absence of selection, the constant acquirement of immunity has not tended to render the race more resistant. It is clear, then, that races grow resistant, not through the transmission of acquirements, but solely through the survival of the fit.[1]

[1] It is to be noted that though one attack of certain diseases usually confers immunity on the individual, yet, in such cases, the race never attains to immunity. Each succeeding generation remains as susceptible as the preceding. Thus Englishmen are as susceptible to infection by measles as Polynesians. But, since measles weeds out those who cannot recover from it (*i.e.*, those who cannot *acquire* immunity against it), the direction the evolution takes is towards an increase of the *power of acquiring immunity*. For that reason, though Englishmen are as susceptible to infection by measles as Polynesians, they recover from it much more easily. The only diseases against which inborn immunity is, or tends to be, evolved, are those against which the individual cannot acquire immunity—consumption for example. When immunity against disease can be acquired by the individual, then the *power of acquiring it* is evolved in the race by Natural Selection. When it cannot be acquired by the individual, when one attack weakens rather than strengthens, then inborn immunity is evolved in the race. In the one case the capacity *to recover from* infection is evolved: in the other the capacity *to resist* infection. In both cases the evolution proceeds wholly on lines of Natural Selection, not on lines of the transmission of acquirements.

CHAPTER IV

THE ROOTS OF EMPIRE

The part played by malaria in the natural and political history of man—The part played by consumption—The world's greatest tragedy—The part played by disease in the fortunes of Anglo-Saxons—The part played by disease in the fortunes of other races—The building of an empire.

Biologists have sought far and wide for evidence in favour of and against the transmission of acquired characters. All manner of unpleasant experiments, generally difficult for the ordinary man to repeat, have been made on all kinds of strange animals. Guinea-pigs and white rats have been great sufferers. Had the experimenters turned to man, the proper study of mankind, their labours would have been needless. Had they considered the non-transmission of the effects of disease and surgical operations, a useless chapter in vivisection would not have been written. Had they considered the aptitude of man's physical and mental acquirements, and their non-transmission, they would not have asked for proofs more convincing.

Natural Selection was alleged as a cause of evolution by Darwin. Thereupon critics raised objections. First they declared there had been no evolution. Next they said there was no such thing as Natural Selection. Nature, according to them, worked in an altogether haphazard way. The fittest did not survive. This view found especial favour in the eyes of two aristocratic and orthodox amateurs, the late Duke of Argyle and the present Marquis of Salisbury, politicians, whose cabinet rank gave weight to their opinions on matters biological. Some professional biologists agreed with, or followed, them. Thereupon experiments to prove or disprove the actuality of evolution were set a-going. Professor Wheldon has lately done to death many crabs; Professor Poulton has caused the elimination of many chrysalises. They sought for evidence of Natural Selection! Under the eyes of Cabinet Ministers and Professors alike, touching perhaps their nearest and dearest, worked those great causes of Natural Selection, those great agents of the elimination of the unfittest, the various zymotic diseases. They sought for evidence of evolution! Zymotic diseases have produced evolution of such vast political and biological importance that the effects of all wars and all diplomacy fall into insignificance beside it.

Malaria and other saprophytic diseases, but

chiefly malaria, have played a great—a very great part in the Natural and Political History of Man. Where malaria is mild, as in certain parts of North America, it is a great deterrent, though not a complete bar to alien immigration. Where it is virulent, as in the Terai and on the West Coast of Africa, it acts as an absolute check to colonisation.[1] In such countries, in exceptional instances, strangers from non-malarial regions, when helped by drugs, may survive for years; but as a rule they perish early. In any case, they are unable to rear families. It is improbable, therefore, that the races inhabit-

[1] "Yet remember, before you elect to cast your lot in with the West Coasters, that 85 per cent. of them die of fever, or return home with their health permanently wrecked. Also remember there is no getting acclimatised to the Coast. There are, it is true, a few men out there who, although they have been resident in West Africa for years, have never had fever, but you can count them up on the fingers of one hand. There is another class who have been out for twelve months at a time, and have not had a touch of fever; these you want the fingers of your two hands to count, but no more. By far the largest class is the third, which is made up of those who have a slight doze of fever once a fortnight, and some day, apparently for no extra reason, get a heavy dose and die of it. A very considerable class is the fourth—those who die within a fortnight to a month of going ashore.

"The fate of a man depends solely on his power of resisting the so-called malaria, not in his system becoming inured to it. The first class of men that I have cited have some unknown element in their constitutions that renders them immune. With the second class the power of resistance is great, and can be renewed from time to time by a spell home in an European climate. In the third class the state is that of cumulative poisoning; in the fourth, of acute poisoning."—"Travels in West Africa," by Mary H. Kingsley, pp. 526-7. Macmillan & Co. *Vide* Appendix E.

ing the worst of these areas can have undergone the whole of their evolution within them; the death-rate of a non-evolved race being so high as to cause extinction, not evolution. They probably dwelt first within less malarious regions, and underwent part of their evolution there. But now, after the sufferings of uncounted generations, after paying toll in millions of lives, they dwell secure in their fever-haunted fastnesses. They cannot be displaced by incoming hordes. They may be conquered by the superior weapons of civilisation, but even then, with the advance of their own culture, they must in time regain their freedom. Not for them is the fate of so many perished and forgotten races, whose poor relics, rude implements and mouldering fragments of bone, alone attest their former existence, and tell of their extinction by stronger and fiercer invaders. They are safe for all time, unless, indeed, the march of sanitary science destroys malaria, always their scourge, but now their principal rock of defence as well.

If malaria and its congeners have played a great part, consumption and other wholly parasitic diseases have played a greater. Being parasitic and earth- and air-borne, they are, necessarily, diseases of crowded populations. Among scattered and nomadic peoples they tend to die out, unless renewed from denser communities. During the

Stone Age they can have afflicted mankind but little. But, for thousands of years, certain areas of the Old World, China, India, and the Coasts of the Mediterranean, have been thickly populated. In ancient, as in modern cities, the wholly-parasitic diseases took toll in human lives, and age after age eliminated the unfittest. Our oldest records tell of plague and pestilence, of water- and air-borne diseases. With the advance of civilisation, as cities enlarged and multiplied, as the densely populated areas widened, the tendency to Disease Selection increased. The conditions became more and more favourable to the spread of infectious disease. Sanitation has done something in England, yet, even now, measles and consumption, for instance, are so prevalent, that no man escapes the chance of infection. Evolution against purely parasitic diseases has proceeded very far. We speak of the West Coast of Africa as having a deadly climate. It is deadly to us, who have not undergone evolution against malaria. But just as deadly is the climate of our own great cities to races that have undergone no evolution against consumption and measles. Polynesians and Esquimaux, for instance, perish as surely in London as Englishmen in West Africa. To judge by analogy, our ancestors of the Stone Age must have been as susceptible to measles and consumption as Red Indians and Polynesians

now are—as little capable of dwelling in dense communities, and consequently of achieving civilisation.[1] Our civilisation, therefore, is conditioned by our power of resisting certain infectious diseases, a power which arose, during the advance of civilisation, by a long and painful process of evolution.

Malaria infests a large portion of the earth's surface, but, except in the south of Asia, its habitat, mainly the great tropical swamps and forests, is thinly populated by human beings. Consumption, the type and the worst of purely parasitic diseases, afflicts a larger and more densely peopled area. It is not unknown in African forests and Indian jungles, and therefore Africans and Hindustanis have undergone some evolution against it; but it has longest, or at least principally, afflicted parts of Western Europe and Eastern Asia, where, for thousands of years, teeming populations have lived in houses so designed for warmth as to be more or less exclusive of light and air. Like all, or most

[1] "They (the Baggara) live always out in some desert place where no trees are, or water, and the houses they inhabit in these 'deyms' are always isolated and irregularly dotted over a wide space in such a manner as to avoid anything like street or enclosed communication. These desert tribes, by the way, are terribly susceptible to all kinds of infectious diseases, which invariably attack them with almost incredible violence, and it is quite possible that they cling to their mode of living, which is undoubtedly highly sanitary, as being in a measure a precaution against epidemics."—*London Correspondent of the Daily News*, 23rd Oct., 1896.

infectious diseases, it was unknown among the scanty populations of the Western Hemisphere, till introduced from the Old World; whence came, not only Old World diseases, but Old World conditions of life as well—teeming cities, air-tight houses, and clothes, the best of all vehicles for the conveyance of infection. Thereupon, four hundred years ago, began the greatest tragedy known to human history—a tragedy so great that it transcends in magnitude all the combined tragedies caused by all wars in all places during all time. A tragedy which is resulting in the extermination of nearly all the races inhabiting half the world. No gradual evolution, as in ancient Europe, was possible to them under the new conditions. There was no discrimination between the fit and the unfit. The Caribs and the Tasmanians are gone. The Esquimaux, the Red Indians, the Patagonians, the Terra del Fuegians, the Australasians, the Polynesians, are going.

Writing of the Spanish occupation of the West Indies, the late Professor Froude said:—

"The Carib races whom the Spaniards found in Cuba and San Domingo had withered there before them as if struck by a blight. Many of them died under the lash of the Spanish overseers. Many, perhaps the most, from the mysterious causes which have made the presence of civilisation so fatal to the Red Indians, the Australians, and the Maoris. It is with man as it is with animals. The races that consent to be domesticated

prosper and multiply; those that cannot live without freedom pine like caged eagles, or disappear like the buffaloes of the prairies. Anyway, the natives perished out of the islands of the Caribbean Sea with a rapidity which startled the conquerors. The famous Bishop Las Casas pitied and tried to save the remnant that was left. The Spanish settlers required labourers for the plantations. On the continent of Africa were another race, savage in their natural state, which domesticated like oxen, and learnt and improved in the white man's company.'

These sentences are typical of much that has been written concerning the decay of the New World races. Almost all writers unite in speaking of it as mysterious, and yet the facts are patent, are manifest to any observer on the spot. There is no more mystery connected with their decay than with the extinction of the dodo and the bison. It cannot be doubted that the New World races have suffered, or are suffering, extinction in consequence of the introduction of Old World diseases.[1] So much is quite beyond dispute, and these causes may be seen in operation over half the world at the present day—in North and South America,

[1] "The tribe of Hapaa is said to have numbered some four hundred when the small-pox came and reduced them by one-fourth. Six months later, a woman developed tubercular consumption; the disease spread like fire about the valley, and in less than a year two survivors, a man and a woman, fled from the newly-created solitude" . . . "Early in the year of my visit, for example, or late the year before, a first case of phthisis appeared in a household of seventeen persons, and by the month of August, when the tale was told me, one soul survived, and that was a boy who had been absent at his schooling." "In the South Seas," p. 27, by Robert Louis Stevenson. Chatto & Windus.

in Australia, in New Zealand, and in the islands of the Pacific, as well as in the Andamans, and several other of the Oceanic islands of the Eastern Hemisphere. The sole mystery has lain in the circumstance that the races of the New World are less resistant to diseases of the purely parasitic type than those of the Old World, and to that mystery I trust I have furnished a key. It is no question of freedom, or of domestication *per se.* The continental savages of the Old World do not perish when brought in contact with civilisation. In India, Ceylon, Japan, and Formosa, are tribes of an exceedingly wild type, that have existed for thousands of years in contact with, and in the midst of most ancient civilisations and very crowded populations. There is no conceivable reason why the Caribs should have been less capable of enduring domestication and slavery, or civilisation, than the equally barbarous, or even more barbarous negroes. Yet they perished, as other New World races are perishing, because, unlike the negroes, they had not been rendered resistant to the zymotic diseases which the Spaniards introduced; and they would have perished had the Spaniards come among them as slaves, not as masters, and adopted their manners and habits of life, instead of forcing on them a change; for their islands lay in the very highway of the com-

merce which then sprang up, in the very path of infection. The natives of tropical America seem destined to survive. Defended like West Africans by virulent malaria, they are not brought into such close contact with Europeans, who cannot, as colonists, spread over the country in millions, as in North America and Australasia. Consequently, though their races have suffered greatly from measles, small-pox, and other air-borne diseases, yet from consumption, the most death-dealing of all diseases, they have suffered comparatively little —so little that the disease selects, and, therefore, does not exterminate. They owe their salvation, besides, to the smallness of their communities, and to the fact that the warmth of the climate renders pleasant the admission of plenteous air to their dwellings.

See then how the matter stands. Were acquirements heritable, races that had longest been afflicted by malaria or consumption would be the weakest against them. In that case malaria, the microbes of which are mainly saprophytic, would destroy all human life within the areas infected by them. Consumption, the microbes of which are entirely parasitic, mainly on man, would render all dense populations, and therefore all civilisation, impossible. But to rise to the full height of this great argument consider, in this relation, the position of the Anglo-

Saxon race. Its ancient home was in the British Isles, where, under stringent selection, it evolved for centuries against purely parasitic diseases. Unchecked by malaria, the Anglo-Saxons spread; smitten by parasitic diseases the Aborigines dwindled. To-day the Anglo-Saxons occupy so large and fertile a portion of the earth's surface that their world-predominance in the future is assured. They may be beaten in war; they may break into separate governments; but disease cannot now exterminate them, and their increasing numbers must secure to them the ultimate victory. The roots of the Empire have struck very deep and wide. Disease has given it space to spread; and when the vast void, which is in the making in the New World is filled by Anglo-Saxons, the Yellow Peril itself will be but a little thing. The millions of the Anglo-Saxons will then be more by many times than all the millions of China. The French were beaten in the eighteenth century. The Germans are hopelessly belated in the start. The only possible rival is the great Russian Empire, but it is hardly possible that the Siberian wastes will ever bear a very dense population.

The Latins, especially the Spaniards and the Portuguese, were less fortunate. They had the first start in the race, and they chose the seemingly richer tropics. But checked, as they were, by

malaria, their diseases did not always exterminate the natives; and, even when the latter did perish, as in the West Indies, their place had to be filled, not by pure Latins, but by half-breeds, and especially negro slaves, imported from West Africa, where malaria is even more rife than in tropical America. All these communities have revolted, and San Domingo is now a Negro Republic, foreshadowing the fate of our Indian and West African conquests. The Latins conquered, but, in a real sense, could not colonize. The experience of Anglo-Saxons in other parts of the world is similar. They are able to colonize South Africa, because it is not defended by virulent malaria, but they must share its possessions with the natives, who, having undergone evolution against parasitic diseases, are not exterminated thereby. And over their future hangs the dark threat of native predominance. To West Africa and India, the homes of malaria, they can go only as conquerors. In a future, perhaps not very remote, the natives, when sufficiently civilised, will certainly expel their masters. In the savage past, races exterminated one another with the sword, now they do it with disease. And the work done by disease is greater by far than anything ever done by the sword.

Historians have chronicled how Jew and Saxon slew Canaanite and Briton, and entered into their

inheritance. They tell us, with vast amplitude of detail, of little and well-nigh purposeless wars, of futile changes of dynasties, and so forth. They give us "low gossip" concerning kings and queens, but, of this momentous march of disease, which has founded great empires, and for ever changed the political face of the world, they tell us nothing. Biologists and philosophers have expended vast learning and labour in tracing the evolution of hoof and of horn. They are nearly all agreed that evolution is caused solely by the elimination of the unfittest. For thousands of years diseases due to micro-organisms have been the main cause of human elimination, and, therefore, of human evolution. But on this great process and its tremendous consequences, biologists are silent. Anthropologists have carefully differentiated the races of mankind, recording minute variations in size, shape, colour, hair, and feature. But they have quite ignored the most important of all human differences. Medical men have a monumental literature on disease as it affects the individual. On disease as it affects the race they have published scarce a volume. No theme more august could have engaged the pen of any writer. They have examined the individual as through a microscope; the race they have wholly neglected.

The building of an empire is a great business.

Wise diplomacy and happy chance, war and racial spirit play their parts and are chronicled by historians. But, speaking generally, their achievements have no great permanence. The gains of one generation or century are often lost by the next. All the old empires thus founded are dead or dying. Even China seems in the throes of dissolution. The Spanish Empire, born but yesterday and suddenly so great, is already dead. Portugal is in the melting-pot. Who can say how long the fortunes of war and diplomacy will continue to favour the Anglo-Saxons? Judged then by ancient standards, every empire has its term. But, as we see, the physical natures of some races have long been undergoing a momentous change. When the New World was discovered four hundred years ago, a new factor in empire-building came into play. Unnoticed by historians, it has given to one vast empire, founded by a little people, a stability so great that it will probably endure as long as the human race inhabits the earth.

CHAPTER V

A THEORY OF RETROGRESSION

The different parts of the higher animals were evolved at different though overlapping periods of a long extending past—Evolution is due to stringent selection which affects only a few parts at a time—Cessation of selection results in degeneration—Difficult to observe in wild animals—Easy to observe in tame animals and cultivated plants—Degeneration due to atavism—In the absence of selection every species tends to revert to ancestral type.

We are now in position to make a fresh departure. We have dealt with evolution; it is time to glance at the complementary doctrine of reversion.[1] Unfortunately, it is difficult to place the doctrine clearly and convincingly before the non-biological reader. The data on which it is founded are very abstruse—hardly to be expressed except in technical terms. Some attempt must be made however. We have seen that evolution results from a stringent selection of the fit. Stringent selection implies stringent elimination. Unless selection be stringent, no

[1] *Vide* Appendix E; also "The Present Evolution of Man," pp. 18-30, 46-8.

evolution can result. The race-horse could not have been evolved from the ordinary horse by the occasional elimination of a chance screw.

The higher animals are compounded of many parts. A bird, for instance, has its organs of sense and locomotion, its digestive and circulatory apparatus, and so forth. Different causes of elimination cause the evolution of different parts. The cause which eliminated a bird, weak in sight, would not be the same as that which eliminated one weak in digestion. When many stringent causes of elimination are in operation at the same time, the species affected undergoes extinction, not evolution; for very few individuals are excellent in all respects. It follows that the different parts of every complex animal were not evolved up to their present standard at the same time, but during different, but overlapping, periods of a long extended past. At one time one group of parts underwent evolution, at another time another group of parts, and at a third time a third group of parts; after which, perhaps, the first group entered on a second period of evolution, and so forth. But though stringent selection does not act equally on all the characters of a complex animal at one and the same time, it is nevertheless true that all useful parts are always under the influence of some degree of selection. Thus, if an animal be weak

in any useful part, for instance in sight, hearing, or digestion, it stands a great chance of being elimininated. It follows that at any given time, in any species of complex animal, while stringent selection causes the evolution of a few parts, a lower degree of stringency maintains, at a more or less fixed standard, the other useful parts, which had been previously evolved.

What then happens to parts which were formerly useful, and which, therefore, in a different environment, underwent evolution under the influence of selection, but which a change in the environment has rendered useless, and therefore no longer subject to selection? For example, what happens to the eyes of cave-dwelling animals that live in total darkness,[1] or to the wings of a species of bird (*e.g.* dodo, ostrich, cassowary, apteryx) that has abandoned the practice of flight? Overwhelming evidence proves that such characters undergo degeneration. Every complex animal displays numerous "vestiges," dwindling remnants of characters which were once useful, but which, through a change in the environment, have ceased to be so, and which have therefore long ceased to be selected. We now reach the gist of our present inquiry. What is the nature of this degenera-

[1] *Vide* "The Present Evolution of Man," pp. 97-9, for a discussion of the eyes of cave-dwellers.

tion? How is it effected? On what lines does it work?

It is difficult to answer this question by a study of wild nature. The same difficulties which prevent proof of selection[1] face us also when we attempt to prove absence of selection. Moreover, the degeneration, like the evolution, of wild animals is always more or less complex. So many dangers environ them, so many characters, eyes, ears, nose, muscles, etc., fend off the dangers, that the stringency of selection is seldom very great as regards any one character. No character therefore undergoes very rapid evolution; for the effects of the elimination of the unfit are too much distributed among the many useful characters. As we have seen, rapid evolution is not possible except when the effects of the elimination of the unfit are concentrated on only one or two characters. This can occur among wild creatures only when a great and rapid change in the environment happens—a thing which rarely occurs; for, as a rule, the environment changes very slowly. Seldom, therefore, can any man observe evolution in wild nature during the short course of his own life. For similar, but even stronger reasons, no man can observe degeneration at work in wild nature; his life is not long enough to cover periods during

[1] *Vide* Ante, p. 25.

which parts, previously useful to wild creatures, become useless. For instance, ages must have elapsed while the dodo changed from an aerial to a ground bird.

But man is able to observe very closely the changes among the plants and animals he has under his destructive care. He eases the stringency of selection in many directions. Characters highly useful in the wild state become useless, or less useful. He is thus able to increase enormously the stringency of selection in some particular direction, and thereby cause rapid evolution in this or that chosen character. From his race-horses, for example, he asks only speed and some endurance, and sacrifices almost all else to the evolution of these characters. He cares little if his finest race-horses grow somewhat defective in sight and smell and hearing. From his draught-horses he asks only weight and strength; from his cattle only an abundance of food; from each of his pets only one or two fanciful qualities; from his plants only excellence in fruit, or flower, or leaf. Every breeder is thus, during the short span of his life, able to observe great changes in plants and animals—changes produced by the concentration of effort on a single object.

It is a known fact that characters that have long been present in a species degenerate very slowly

after they become useless, and therefore exempted from selection. Thus birds have possessed wings for millions of years; they are of little use to tame birds; but an enormous period would have to elapse before our tame birds became wingless. But characters that have recently appeared are very apt to vanish in a generation or two. Thus the children of an abnormally big man and woman are generally smaller than their parents; a sixth finger seldom persists long in a family. As compared to the characters of wild animals and plants, the special characters of the tame and cultivated varieties are of very recent origin. We have, besides, exceptional opportunities of observing their evolution. We know what the prize breed started from; we generally have the parent variety to compare it with; and the evolution, having been on very simple lines, is, in the absence of complexity, easy to study. Thus race-horses have only recently been evolved; we know exactly how they differ from their progenitor, the ordinary horse, which is with us still. The same is true of all the other prize breeds of animals. Now let us ask ourselves, what would happen if, instead of carefully selecting for breeding purposes our race-horses and other prize breeds of animals, we bred indiscriminately, allowing the inferior animals to have as much influence on posterity as the superior?

Any breeder could tell us. The prize variety would swiftly revert to the ordinary type. Each succeeding generation would be inferior to the preceding generation, till the ancestral type was at last reproduced. The more rapid the previous evolution, the more rapid would be the subsequent reversion. When several prize varieties, *e.g.* pigeons, have been evolved from a common ancestral stock, we get, if we interbreed them, the acme of non-selection—artificial non-selection. In such a case the common stock reappears. Thus the wild blue pigeon, the *Columba Livia*, reappears as a result of interbreeding the many varieties of tame pigeons.

Our prize breeds of animals have been evolved under very stringent selection. But many of our garden plants have been evolved under selection a thousandfold more severe. Most plants are capable of bearing annually innumerable offspring, among which we are able to exercise very stringent selection. Moreover, all the plants we have most rapidly evolved are capable of being propagated by means of slips and grafts. A plant reared from a slip, sucker, or graft is not a new individual ; it is merely a detached part of an old individual. Roughly speaking, the process of the evolution of these plants is as follows : The gardener sows a number of seeds from a good plant. He chooses the best of the resulting offspring, destroying the others,

and propagates it by means of cuttings. He repeats the process again and again. He finds that, as a rule, seedlings develop into plants inferior to the parent; but that now and then a superior plant arises. It is as though, in an attempt to improve the speed of race-horses, we chose the swiftest individual, destroyed the rest of the species, and propagated him by means of slips, thus making the whole race as swift as the swiftest; and repeated this process generation after generation. It is evident, owing to the facilities for selection afforded by the great number of seeds borne by plants, and by the fact that some plants can be propagated by cuttings,[1] that many of our prize plants have been evolved by a process of selection infinitely more severe than that by which our prize animals have been evolved. Indeed, it is probable that only a very few real (*i.e.* seed) generations intervene between some of our most evolved garden plants and their wild progenitors. Now what happens if we breed indiscriminately from our garden plants, starting with the best? In a very few generations—sometimes in a single generation—the cultivated plants reverts to something very like the wild variety—but not to the wild variety exactly; for, while under artificial selection the

[1] It is asserted by some botanists that all plants can be so propagated.

cultivated variety was undergoing evolution in a certain direction, it, protected by man, was undergoing degeneration in other directions, *i.e.* in characters which were useful in the wild state, but became useless in the protected cultivated state.

It seems then that degeneration is due to atavism — to a reversion to the ancestral type. When reversion to a recent ancestor takes place, the retrogression is comparatively small in amount; when a remote ancestor is reverted to, the retrogression is comparatively great. It follows as a necessary consequence that rapid evolution is succeeded, on cessation of selection, by rapid reversion; for, under such conditions, reversion to any ancestor results in much greater retrogression than would be the case had the previous evolution been slower. Moreover, evolution proceeds step by step, each generation playing its part in it. But each generation does not necessarily play a part in retrogression. A son, skipping intermediate generations, may revert at a bound to a remote ancestor. A race-horse never springs from the loins of a screw, the descendant of screws. But the son of a race-horse, the descendant of race-horses, is often a screw. Reversion, uncontrolled by selection, therefore, is always much swifter than antecedent evolution.

Every character had its beginnings. At one

time it did not exist. Then, from small beginnings, it grew, under the influence of selection, perhaps to a great magnitude. If it becomes useless, it is no longer subjected to selection, and reversion sets in. Ancestors more and more remote are approximated to, till, if the process be continued long enough, that most ancient condition is reverted to when the character did not exist. We cannot trace the course of reversion among wild plants and animals, for the process is slow, and our means of observing it with precision is insufficient; but we know from the evidence of vestigial remains, that degeneration occurs among them, and the phenomena of reversion among our artificially evolved plants and animals enables us to determine the nature of the degeneration.

But whether it be agreed or not that degeneration is caused by the reappearance of the ancestral type, it is agreed by all authorities that this at any rate is true, that whenever a character ceases to be useful it undergoes degeneration, and tends to disappear. That fact is of immense importance to our main inquiry.

I have now completed the introductory portion of my work, and may in comfort proceed with my proper theme. The ground is cleared, and by anticipation I have met some objections, which would otherwise have been raised. The four main

facts I have endeavoured to drive home have been—(1) that characters acquired by the parent are not inherited by the child; (2) that evolution results from the *stringent* elimination of the unfit; (3) that when the elimination which has caused the evolution of any character, ceases, or nearly ceases, that character undergoes degeneration; and (4) that degeneration is due to atavism—to a process of reversion which, step by step, retraces the previous evolution till, if it be continued long enough, that more or less remote ancestor is approximated to in whom the character did not exist.

We have seen in the preceding pages that Natural Selection, the thing so often denied, actually does occur in the only case in which we are able to note its operations. We cannot tabulate the death-rate of wild animals and plants, but we are able to tabulate the death-rates of the races of men, and to observe that under the influence of Disease Selection the physical nature of mankind is slowly altering towards a momentous conclusion. But zymotic disease is not the sole selective cause of human elimination. If we continue our study of selective death-rates we shall find that a mental alteration, in every way as momentous as the great physical change we have chronicled, is at work, slowly, but mightily, moulding the destinies of the races of mankind.

CHAPTER VI

THE DEATH-RATE FROM ALCOHOL

Alcohol highly esteemed anciently as a medicine — Less esteemed to-day—The statistics of Insurance and Friendly Societies—Estimates by medical men.

FROM time immemorial, all kinds of medicinal virtues have been attributed to alcohol. It has been termed the "water of life." Almost as often as new solutions of it—that is, new ways of manufacturing and flavouring it—have been discovered, men have rejoiced as at the birth of an heir-apparent. The jubilation has generally been directly proportionate to the prevailing ignorance. Many cordials were manufactured anciently by religious bodies, and saintly discoverers were supposed to have endowed them with miraculous properties. We read how wounded and fainting knights-errant were by them revived and fired with a new fervour for battle. At the present day we should perhaps suspect Dutch courage. But it is a scoffing and sceptical age, the feet of which trend to perdition. The belief in particular solutions of

alcohol has not altogether vanished. The ladies, who preside over the cottage homes of England, have unbounded faith in porter and stout as aids in nursing. Connoisseurs and experienced drinkers dwell with delight on the merits of favourite liquors "in a barrel of which no headache lurks." Fashionable physicians still display a conflicting knowledge of the diverse and conflicting properties of expensive wines and spirits—solutions of alcohol differing chiefly in strength, colour, and flavour. They tell us that the virtues of these particular solutions reside in their special "ethers." But no medical enthusiast has thought it worth while to separate the ethers for medicinal use—as morphia has been separated from opium, or quinine from Peruvian bark. Until very recently, physicians often prescribed amazing, I had almost said fatal, quantities of alcohol. But to-day a more modern school deny all virtue to alcohol. In point of fact, it is a moot question whether alcohol is ever beneficial, especially to healthy people, to the winners in life's race, the fittest, to those who hand on their character to posterity. No one, however, denies that it is often very harmful. We have all known men of whom it is said that they have drunk or are drinking themselves to death. There can be no shadow of doubt that an enormous human mortality is due to alcohol.

It is impossible to tabulate the death-rate caused by this potent agent of elimination. The Registrar-General's returns furnish no clue. Alcoholism is a frequent cause of fatal disease, but death from alcoholism, as from venereal disease, is held to be very disgraceful; the imputation of it is highly offensive to surviving relatives. *De mortuis nil nisi bonum.* Practising physicians, as much from motives of kindness as of self-interest, pay heed to the charitable precept. They seldom allege alcoholism as a cause of death. They allege instead the immediate case of death, cirrhosis of the liver or kidneys, or disease of the arteries, or other complaint, which resulted from excessive drinking. Did they do otherwise, they would cease to be practising physicians. They would have no further opportunities to sign death certificates. Accordingly, the Registrar-General reports the percentage of deaths due to alcoholism as exceedingly low,[1] and as occurring in undue proportion among the inmates of work-houses and other public establishments.

A more reliable source of information is furnished in statistics compiled by Friendly and Insurance Societies. These — the Insurance Companies at any rate—are mere business corporations, having purely financial ends in view. They are, therefore,

[1] About 1 in 20,000.

quite without bias, and their returns may be accepted as true to all intents and purposes. It has been said that statistics, properly manipulated, may be made to prove anything. There is so much truth in this view that the wise man regards them with suspicion—especially when they controvert his own cherished convictions. The object in view, however, is a very important consideration. When statistics are compiled to guide the compiler, particularly in financial matters, they are generally trustworthy; when they are compiled to guide other people, they are not so often worthy of credence—hence the frequently misleading nature of the statistics compiled by promoters of bogus companies, and by enthusiasts having religious, philanthropic, or patriotic ends in view.

Dr James Ridge, of Enfield, has published a very suggestive and important little book.[1] In it are presented a mass of statistics, culled from the records of a number of friendly and insurance societies, which places the devastation caused by alcohol in a very clear light. For full details I must refer readers to the fifth chapter of his work.[2] The following, however, are some of his facts. The United Kingdom Temperance and General Provident Institution is a life insurance company,

[1] "Alcohol and Public Health," by James Ridge, M.D. London: Lewis & Co.

[2] Quoted in full, by permission, in "The Present Evolution of Man."

which has separate sections for abstainers and non-abstainers. Needless to say, this office, like all others, rejects inebriates. But since inebriates can be detected by the examining physicians only when they are obviously suffering from the immediate or the remote effects of alcoholism, doubtless many inebriates are accepted, who would be rejected were the truth concerning them known. All, except fanatical abstainers, are agreed that strictly moderate drinking influences the death-rate little, if at all. Thus few would maintain that the lives of the temperate Spanish or Italian peasants are shortened by their habitual use of alcohol. Alcohol takes its toll almost exclusively from the ranks of habitual soakers or drunkards. If, then, insurance statistics prove that abstainers on the average have lives appreciably, or considerably, longer than non-abstainers, this fact must be taken as indicating that there are among the latter a proportion of excessive drinkers, who have been accepted through error or fraud. Insurance companies make their financial arrangements on a basis of "expected deaths," which, when tested by "actual deaths," leaves, or should leave, a safe margin for profit. Dr Ridge thus sums up the statistics of the office under consideration :—

"The expected and actual claims in each section for the last twenty years have been published. . . . This gives a mortality in the Temperance Section of 71.49 per cent., and in

the General Section, 96.66 per cent.—a difference in favour of the former of 25.17 per cent. There were 1433 fewer deaths than expected in the former section, and 243 fewer in the latter, both being calculated by the same life tables. If the members of the General (non-abstaining) Section had lived on the average as long as the abstainers, there would have been only 5130 deaths instead of 7034—a saving of 1904 lives. Similarly, if the abstainers had used alcohol at the same rate as they, the deaths would have been 4693 instead of 3423, a loss af 1270 lives. Again, if all had been non-abstainers, the deaths would have been 11,727; if all had been abstainers, they would have been 8553—a difference of 3174 deaths. This represents the true measure of the injury done to a number of picked lives by the use of alcohol. . . . The same fact comes out in the experience of the Sceptre Life Office. This is a much younger and smaller office, and draws a large number of its lives from the members of one religious denomination. The majority of them are good steady lives. The abstainers are kept distinct. In the seven years, 1884-90, the expected claims in the General Section were 679, and the actual claims, 527 = 77.61 per cent. In the Temperance Section the expected claims were 306, and the actual claims 174 = 56.86 per cent."

A mass of other statistics is given by Dr Ridge. Thus he shows that Rechabites and Sons of Temperance, who are members of total abstinence societies, have a death-rate considerably lower than Foresters and Oddfellows, who, as a body, are non-abstainers. Again, before 1860, grocers were not allowed to sell wines and spirits. In that year an Act was passed which permitted them to do so. The effect of this increased facility for obtaining drink on their own mortality is shown by the following table which Dr Ridge quotes from the Appendix to the Registrar-General's Annual Report :—

MORTALITY PER CENT. OF GROCERS.

Ages . . Years	15	25	35	45	55	65	75 and upwards
1860-61	.531	.840	.923	1.280	2.053	4.334	12.488
1871 . .	.592	1.115	1.021	1.466	2.567	5.461	13.442
Excess in 1871	**.061**	**.275**	**.098**	**.186**	**.514**	**1.127**	**.954**

An immensely important fact brought out by this table is the early age at which alcohol begins its ravages. Thus among grocers even boys of fifteen perish. Probably none of the latter die of actual alcoholism, but the alcohol they take renders them less resistant to the various diseases which are the immediate causes of their deaths.

The following tables compiled by the eminent actuary, Mr F. G. P. Neison (and quoted by Dr Ridge), afford confirmation of the truth that alcohol claims many victims among the comparatively young. The first table distinguishes between the death-rates of abstainers and non-abstainers at various ages; the second shows the numbers which survive to various ages, and the third gives their average prospective longevity at various ages.

RATE OF MORTALITY PER CENT. PER ANNUM.

Age.	Oddfellows.	Foresters.	Rechabites.
Under	1866-70.	1871-75.	1878-87.
15	.632	.753	.603
25	.788	.807	.509
35	1.094	1.174	.619
45	1.647	1.802	1.119
55	2.877	3.286	2.325
65	5.911	6.510	5.815

The Number that would survive to Age.	Of 1000 Persons all aged 18.		
	Oddfellows. 1866-70.	Foresters. 1871-75.	Rechabites. 1878-87.
25	957	950	962
30	922	915	938
35	844	873	914
40	840	828	888
45	791	776	856
50	764	714	815
55	636	641	760
60	584	552	686
65	483	453	590
70	370	335	461
75	245	218	306
80	134	118	165

THE AFTER LIFE TIME.

At Age.	Oddfellows, 1866-70.	Foresters, 1871-75.	Rechabites, 1878-87.
	Years.	Years.	Years.
20	41.3	40.2	45.1
30	34.0	32.9	37.3
40	26.7	25.8	29.1
50	19.9	19.1	21.2
60	13.6	13.2	14.2
70	8.5	8.3	8.5
80	5.0	4.9	4.9

Dr Ridge quotes also various attempts made by medical men to estimate the mortality due to alcohol in the United Kingdom. Some of them

place the annual death-rate as low as 52,640, others as high as 120,000. But into all these medical estimates there enters one great source of error. They are founded on returns furnished by practising doctors. But if a medical man does not *know* that a death has been accelerated by alcohol, he must place it in the opposite category; and very frequently, when a death has been so accelerated, he cannot know. For instance, a man may perish of some illness or accident from which he would have recovered had he not been weakened by previous intemperance. His doctor, seeing him perhaps for the first time in his last illness, would scarcely attribute the fatal result of, say, consumption, or a broken leg to inebriety, which may have occurred many years previously, and which is not mentioned nor even thought of by the patient or his friends. To take a striking example, it has been found that the wounds of non-drinkers heal better and more quickly than those of drinkers. Thus surgeons accustomed to European wars are often astonished at the wonderful recoveries made by Arabs, Turks, Afridis, and other non-drinkers. Now who can say what proportion of all the thousands that have perished on both sides in the Boer war would have survived had they never touched alcohol? What surgeon, seeing a previously unknown

soldier dying of shell or bullet wounds, or even of privation or enteric fever, would dream of attributing his non-recovery to intemperance? It is probable, therefore, that the highest estimates, based on medical returns, fall short of the actual truth. But even if only 120,000 deaths result annually, directly or indirectly, from the use of alcohol, this would represent about one-sixth of the total mortality from all causes — a greater proportion than results from any single disease. It is, therefore, abundantly manifest that if alcohol, this great agent of elimination, be selective in its action, it must be a most potent cause of evolution.

Let us, then, endeavour to discover whether alcohol eliminates a particular type of individual. If it does, let us try to trace the course of the resulting evolution.

CHAPTER VII

THE CAUSES OF DRUNKENNESS

Men drink alcoholic solutions for three distinct reasons: To satisfy thirst; to gratify taste; to produce a direct effect on the brain—Only the last is a cause of drunkenness—Men differ in their predisposition to inebriety—As a rule, men drink in proportion to their individual predispositions—Self-control a subordinate factor in the causation of sobriety—Lack of temptation the principal factor.

DRINKERS of alcohol may be divided roughly into three classes. In the first place, many men drink merely to satisfy thirst. They take alcohol, and the other special constituents of intoxicating beverages, as they might take lemon-juice, simply to make the *water* they imbibe more palatable. They drink for the same reason as they eat: a necessary constituent of their bodies has become deficient, and they seek to supply it. They add alcohol to their water as they add sauces to their meat. But they take the alcohol as they take the sauce, not for the sake of the flavouring agent, but for the sake of the thing it flavours. Such men,

when actuated by thirst alone, are never drunkards. They prefer the more dilute solutions of alcohol, usually light wines and beers, which contain in greatest abundance the particular constituent they desire—water. Having had enough of the water, they take no more of the flavouring agent—alcohol. In the absence of wine or beer, they can be satisfied with water otherwise flavoured, as with tea or coffee.

A second class drink intoxicating beverages, not so much from thirst, as for the sake of the flavouring agents. They delight in the *taste* of *some* solutions of alcohol. They drink, as a girl eats chocolate, to produce a delightful sensation in the *mouth*. They are generally connoisseurs and drinkers of wines. Very few men toy with beer or spirits, except perhaps as an accompaniment to tobacco, and then only to excite the desire for the latter. The taste of beer and spirits is not sufficiently delightful. The true connoisseur is a wine-drinker. Bad wine disgusts him. Of good wine he prolongs his enjoyment as long as possible, holding it to the light, smelling it, sipping it, rolling it in his mouth and round his palate, in every way getting as much of its beauty, aroma, and taste as he can. Such men, also, are rarely drunkards. A little surfeits them, just as the average girl is surfeited by a moderate amount of chocolate. To

them the first glass is the most enjoyable; but, as they drink, their palates become cloyed, and at length the finest wines no longer give pleasure through the sense of taste.

A third class of drinkers drink, not for the satisfaction of thirst, nor for the gratification of the palate, but to produce that mental effect which, in its extreme forms, we call drunkenness. The heated athlete—the cyclist, for example—who calls for a quart of beer, and, after gulping it down, departs satisfied, desires a pleasure evidently quite different from that which moves the connoisseur, toying with his rare wines. Both, again, desire gratifications totally different in kind from that which the drunkard seeks when he indulges to excess in some potent intoxicant, which may increase thirst and be of nauseous taste, as, for example, methylated spirit.

Men therefore drink alcoholic beverages, in the first place, to satisfy thirst, an organic craving for a necessary constituent of the body—water; in the second place, to gratify the sense of taste, in other words, to produce a sensation of pleasure through excitation of the peripheral nerve endings in the mouth; in the third place, to produce, by alcohol circulating in the blood, and acting directly on the brain, a stimulation, or what feels like a stimulation, but which soon becomes a narcosis or paresis. But,

though men drink for three separate reasons, it must not be supposed that all drinkers are sharply separable into three distinct categories. The same man, at the same time, may drink to satisfy his thirst, his palate, and his craving for drunkenness. Or at first he may desire to satisfy his thirst, next to gratify his palate, and lastly he may seek for intoxication. Or again, at the beginning of his drinking career, he may drink primarily to satisfy his thirst or taste, and, at the end, primarily to gratify a craving for intoxication. The fact remains, however, that, while many men drink merely to satisfy thirst or taste, the principal motives with others is to obtain those feelings of intoxication which alcohol produces when acting, in considerable volume, directly on the central nervous system.

It has been necessary to draw these distinctions clearly, because much confusion exists in the public mind. The extreme wing of the temperance party regard all drinkers as drunkards, who differ only in degree; and a drunkard is often spoken of as a thirsty soul. But moderate drinkers, those who drink *merely* to satisfy thirst or taste, are never real drunkards; and the real drunkard, as such, is not a thirsty soul. He drinks, not because he is thirsty, but because he craves for that mental state, that mental paresis, which we call drunkenness. It

may be argued that, since pure alcohol, diluted only with water, can gratify no man's palate, and since the smallest amount of alcohol circulating in the blood must produce some effect on the brain, therefore every man who drinks alcohol is to some extent a drunkard. The argument is not difficult to meet. A thing unpleasant in itself may be pleasant as a flavouring agent, for example, cayenne pepper. Moreover, in the common acceptance of the term, the drunkard is one who imbibes alcohol till he is mentally weakened to a degree more or less perceptible. It is with this mentally weakened person that we have to deal. Without him, the temperance problem would not exist, in spite of thirsty souls and connoisseurs. In the future, therefore, when I speak of the effects produced by alcohol, for example, of the enjoyment produced by it, it must be understood that I am not alluding to thirst or taste, but solely to the direct effect of alcohol on the brain. In other words, to its effects as an intoxicant.

Not only do men differ in kind as regards their motives for drinking alcohol, but those who use alcohol as an intoxicant differ immensely in degree also. The full and clear recognition of this fact is so very important that it is necessary to dwell on it at length. Men differ in all their mental and physical parts, in size, in strength, in shape, in

colour, in their mathematical, artistic, and other faculties, in their capacity for enjoying tobacco, or salt, or sugar. There is no single character in which men do not differ in degree. Judging by analogy, it is therefore certain that they are not equal in their enjoyment of alcohol, or, to put it more precisely, in the amount of alcohol they are capable of finding enjoyable. Just as some men are satisfied with a single pipe of tobacco, so some men are satisfied with the effect produced by a single glass of alcohol at meal-times, or as a "night-cap" before retiring to bed. Others desire deeper indulgence; they are not satisfied till distinctly appreciable mental ill-effects are produced. Yet others desire complete intoxication.

Now it is only reasonable to say that, *as a rule*, men drink in proportion to their desires, and that, therefore, the deep drinker, *generally speaking*, is one so constituted mentally that deep indulgence is delightful to him,[1] whereas the moderate drinker is one to whom moderate indulgence is more pleasant. To take an illustration: suppose two men are equal as regards moral training, will-power, opportunities of procuring alcohol, and all else,

[1] We may go even further and say that the habitual deep drinker is *always* one to whom deep intoxication is pleasant; for it is inconceivable that any one would brave the many ill-effects of deep indulgence, the physical and mental evil, the social and material loss, unless intoxication were to him, in some way, a pleasure or a comfort.

except their delight in alcohol. It is only reasonable to expect that he who has the stronger desire will be the more likely to yield to temptation. So, also, *generally speaking*, men indulge in sugar, or salt, or tobacco, or anything else in proportion to their desires. Of course there are exceptions to this rule. Human life is very complex; alcohol is not the only factor that determines our actions. Some men to whom deep indulgence would be delightful, as conferring positive pleasure or as dulling pain, lack opportunity, and, therefore, temptation; others of the same nature, but with plenty of opportunity, resist temptation from moral motives. But I speak only of the general rule. I suppose, merely, that, on the average, the man who is so constituted as to be much tempted by alcohol, yields more often, and to a greater extent, than he who is so constituted as to be less tempted. The contrary assumption involves the obvious absurdity that all men are equal in their delight in (and, therefore, desire for) alcohol, or the yet greater absurdity that, *generally*, deep drinkers are those who have moderate desires but little self-control; whereas moderate drinkers, as a rule, have deep desires, but much self-control.

One or other of these assumptions is constantly made. For example, many sober men, and, in particular, many temperance reformers, have a theory very flattering to their self-esteem. They

assume that men are drunken or sober accordingly as they do, or do not, exercise self-control. It does not enter their minds that a man may be temperate, and yet exercise no self-control ; in other words, that he may be sober because deep indulgence is not agreeable to him. Self-control is not alleged to be a principal factor in abstinence from, or moderation in, the use of tobacco. It is manifest, indeed, that most smokers indulge to near the limit of their capacity for enjoyment. The nicotine habit, as a rule, does very little harm to health, and, therefore, as regards it, self-control is not vehemently insisted on. But deep drinking does very much harm, and therefore self-control is urged, and rightly, with vehemence. But because it is thus urged, the mistake is made of supposing that it is the only, or the principal, factor in the causation of sobriety. As a fact, self-control is the principal factor only in those exceptional cases in which the moderate drinker, or abstainer, has both the craving for drunkenness and the opportunity of gratifying it.

Let the reader judge for himself. He—I apologise for the implied doubt in advance—is probably neither an abstainer nor a drunkard, but, like most people of the better classes,[1] a moderate

[1] The reason for alluding to the "better classes" will be apparent presently.

drinker. Is he, then, temperate only because he exercises self-control? Does he answer "Yes"? Then, from the bottom of my heart, I pity him. Continually tormented by his unsatisfied craving for drunkenness, he must indeed be a miserable being—a being only one degree less miserable than an actual drunkard. I, most certainly, am not constituted as he is. Never in my life have I had to resist the craving for alcohol. I am temperate, not because I have resisted temptation, but through a fortunate lack of it. I have not what doctors call the alcohol diathesis. I am sure most sober men are constituted as I am, not as my reader says he is. They can, as workmen say, "take a glass or leave it." Most people with whom I am brought into social contact are temperate manifestly without effort. A little alcohol satisfies them, more would awaken sensations which, on the whole, are unpleasant. A certain section of moderate drinkers —who generally drink somewhat more — would doubtless enjoy deeper indulgence, but the craving is not so strong as to balance their dislike to the consequences. A remainder so delight in alcohol, are so driven to it, as by the force of a tempest, that, ignoring the remote consequences, they seek immediate satisfaction and are intemperate.

I am tolerably sure, in spite of my reader's hasty

declaration of a *proneness* to drunkenness, that his personal experience, supposing him to be an average member of better-class society, is similar. Let him also think of those with whom he is brought into social contact, particularly of those with whom he is most intimate, his own relatives. Has he observed in his wife or mother, for instance, a tendency to intemperance, checked only by a sense of duty? Are his father, his brother, and his sister victims of this miserable craving, as they are "victims," if I may use the word, of the cravings for food and water. I think, if he and his relatives are average people, he will recognise, on reflection, that they are temperate, not in spite of their inclinations, but because of them; that, in fact, alcohol does not tempt them to drunkenness, but, at most, to a mild indulgence only. But he must know people in his own class of life so differently constituted that alcohol does greatly tempt them to intoxication, notwithstanding that they have had the same advantages of education and environment that he has had. Deep indulgence affords them keen pleasure, or, at least, surcease of mental pain.

It is often argued, since no man begins life with a craving for alcohol, and since a more or less prolonged indulgence is usually necessary before men acquire the drunkard's craving, that therefore drunkards are of worse up-bringing, or of weaker

wills, than their fellows. In other words, it is supposed that the moderate man is temperate merely because, through training or choice, he exercises self-control early and always; but the deep drinker drunken because he exercises it never. But this view errs because all the factors are not taken into account. All men of course start life without any craving for alcohol, and, in so far, are equal; but the essential fact remains that they differ vastly with respect to the ease with which the craving may be awakened and the strength it may attain. Even if it be contended—erroneously I am certain—that all men are capable of enjoying drunkenness; that in every man the craving for drink may gather volume with indulgence, like a rolling snow-ball, it must still be admitted that it gathers volume much more swiftly, easily, and irresistibly in some men than in others. The speed with which a snow-ball grows depends, among other things, on the slope of the hill. In some men the hill is steeper than in others. A well-trained child is certainly less liable to become drunken than a worse-trained; but, nevertheless, of two children, equally well-trained, the one with the greater capacity for enjoying alcohol is the more likely to yield to temptation. However good the training, men still tend to drink in proportion to their desires.

Moreover, the assumption that temperate men are necessarily strong-minded, whereas drunken men are necessarily weak-minded, has no foundation in fact. History and everyday experience abound with instances to the contrary. It is a simple truth that the will of man, as of all animate creatures, is exercised, *as a rule*, to gratify, not to cross, his desires. The man of powerful will who has an ardent craving for drink is, therefore, generally drunken, not sober. He uses his powers to gratify his strong desire. The weak man will often use his opportunity; the strong man will generally make it.

A somewhat stormy controversial experience assures me that the foregoing argument will be misinterpreted. Because I have stated that, *in most cases*, men are sober through lack of temptation, not through the exercise of self-control, I shall be said to have decried the virtues of self-control. On the other hand, I daresay, the average reader, guided by his own experience, is wondering why I have devoted so much space to demonstrate that which seems to him, as to me, self-evident. But, if he have patience, he shall see that the question of self-control, not less than the question of the transmission of acquirements, is a hinge on which turns the whole question of temperance reform. If self-control be the principal factor in the causation of

sobriety, then temperance reformers of the dominant school are right. If, on the contrary, lack of inclination is the principal factor, then they are wrong, and the whole scheme of reform, advocated by them, must lead ultimately to increased drunkenness only.

CHAPTER VIII

ALCOHOLIC SELECTION

Alcohol, a selective agency—Analysis of the craving for drink —The three factors—The inborn factor is transmissible, the acquired factors are not—The confusion of *post* with *propter hoc*—Application of the Lamarckian and the Darwinian doctrines.

It is plain, then, that just as men differ in every other peculiarity, so they differ—and differ greatly —in their capacity for enjoying indulgence in alcohol. Some are satisfied with very moderate indulgence; others crave for the deepest intoxication: between the extremes lie all shades of drinkers. It is plain, also, that, *as a rule*, men drink in proportion to their desires. Lastly, we see that alcohol is a poison. It is only reasonable to conclude that alcohol poisons to the greatest extent those who drink deepest of it.

It is true that some men are able to tolerate much greater quantities of alcohol than others. Nevertheless, even he whose tolerance is the greatest is more injured by a large than by a small

quantity. It follows that alcohol, year after year, eliminates from the race a great number of people so constituted that intoxication affords them keen delight, leaving the perpetuation of the race in great measure to those on whom intoxication confers little or no delight. Many "potential drunkards"—as we may term those capable of enjoying deep indulgence—escape of course. They are saved by lack of opportunity, or by a strenuous and brave resistance to temptation. But among all the victims of alcoholism, there is probably not one who has not the "alcohol diathesis"; for it is inconceivable that any one would accept the penalties of deep indulgence if deep indulgence were not delightful to him. Now, since alcohol weeds out enormous numbers of people of a particular type, it is a stringent agent of selection — an agent of selection more stringent than any one disease. Many diseases have been the cause of great and manifest evolution. It follows that alcohol, which has been used by many races for thousands of years, should be the cause of an evolution at least as great as that which has been caused by any one disease.

But, before attempting to estimate this evolution, let us return for the last time to the old controversy between the Lamarckians and Neo-Darwinians, and see how it bears on this par-

ticular question. The public, supported by the great majority of the medical profession, are strong Lamarckians. They suppose that the effects produced by alcohol on parents are transmitted to offspring. The language used by some writers seems to imply even a belief that parental drunkenness causes an actual longing for the substance alcohol in the child.

Every drunkard's desire for alcohol must contain three necessary factors, one inborn and two acquired. First, the drunkard must be so constituted as to be capable of enjoying deep indulgence; for, of course, as I have already said, no one would be drunken who was not capable of enjoying drink—whether as a means of deriving positive pleasure, or as a means of relieving physical and mental discomfort or pain. This factor is certainly inborn, and therefore as certainly transmissible to offspring. The man who has it is cursed with the "alcohol diathesis," with the "predisposition" to drunkenness. Thus most savages are keenly capable of enjoying drink, and their offspring inherit the capacity.

The second factor is the drunkard's knowledge of alcohol—his actual recollection of the pleasurable sensations which former acts of drunkenness aroused in him. Without this second factor, this actual experience of drink, no man can crave for

alcohol in the sense meant. Thus a man, who has never tasted alcohol, may, perhaps, desire it as a delight-giving thing, of which he has heard, just as an average Englishman may, perhaps, desire hashîsh or a mangosteen; but he cannot crave for it with that kind of craving, begotten of experience, which the drunkard feels. No one will maintain that a child inherits its parent's recollections. Therefore it is plain that the actual craving for drink is never transmitted. In the absence of actual personal experience of alcohol, there can be no desire (in the sense meant) for it. It is scarcely necessary to labour this point; but the loose language so frequently used justifies some reference to it.

Besides the capacity for enjoying alcohol, and the actual recollections of the sensations evoked by alcohol, every drunkard's desire contains a third factor. The more a drinker indulges in drink, the more within limits does he crave for drink.[1] Thus the craving of an old toper does not develop at once; it grows with indulgence. It is true some savages—Red Indians for example—are so constituted that the very first experience

[1] I say within limits, because the growth of the craving does not continue indefinitely. After a time it ceases to increase. But the limits vary widely with different individuals. The increase is small in the typically moderate man; it is very great in the typical inebriate.

of drink appears to awaken in them a furious desire for deep indulgence; but it is probable that, even in them, the appetite grows with feeding. At any rate, it is certainly true that it grows thus in all European drunkards. It is this growth of craving that writers generally allude to when they say the craving for drink is transmitted. They suppose that the father's drinking increases his capacity for enjoying alcohol and therefore his craving for it; and they think that this increase of appetite is transmitted to offspring.

They found their belief on the indisputable fact that drunkenness tends to run in families; in other words, on the fact that drunken parents tend to have children who in turn are drunken.[1] But here we happen on a very fine, but vastly important point. A drunkard drinks because he is so constituted that experience of alcohol awakens in him a craving for alcohol. Whether he drinks or not, he tends to transmit this inborn constitution of mind to his child. Thus many savages whose parents and ancestors never tasted alcohol (*e.g.* Esquimaux and Tierra del Fuegians) become exceedingly drunken when given the opportunity. Their parents had the capacity for enjoying drink, but had not opportunity of indulging it. Again,

[1] *Vide* Appendix F.

men who, against their natural inclination, are abstainers, from moral and prudential motives, often have drunken children. The fact that drunkenness tends to run in families, therefore, does not of itself constitute a proof that parental drinking is a cause of filial intemperance. It is merely an instance of the universally admitted truth that children tend to inherit the inborn characters of the parent. A big man tends to have big children; a fair man, fair children; a man so constituted as to find delight in alcohol tends to have children similarly constituted.

Even if it were true that parental drinking increased the child's tendency to drink, we could not, by observing the drunken children of a drunken father, find proof. For we could not, by observation, separate that portion of the child's tendency which was due to mere inheritance of the parent's inborn capacity for enjoying drink from that increase of tendency which resulted from the parent's drinking. The voluminous statistics which medical men and others have compiled, and which prove that drunken parents tend to have drunken children, have, therefore, no bearing on the point at issue. *Post hoc* has been confused with *propter hoc*. It would be as reasonable to suppose, because a man enjoys and eats peaches and mutton, and has a son who also enjoys peaches and mutton, that

the child's enjoyment of these edibles is due to the father's indulgence in them. Clearly the proposition is absurd. The child's inborn likes and dislikes depend on something deeper than the mere acquirements of the parent. Savages, whose parents and ancestors had no previous experience of peaches or mutton, enjoy them quite as much as other people. The case of alcohol is precisely similar. It is just as absurd to suppose that, because a drunken father has a drunken child, that *therefore* the father's drinking is the cause of the child's predisposition to drink.

Again, some writers, principally medical men, have published statistics, or, more often, mere statements, declaring that they have observed "degeneracy" in the children of drunkards.[1] They suppose further that "degeneracy," whatever that may imply—these vague terms are the bane of science — predisposes offspring to intemperance. But no evidence is forthcoming that it does predispose to intemperance, and degeneracy may be observed in the children of non-drunkards. So numerous are the sources of error that it is not possible to obviate the confusion between *post* and *propter hoc* except by statistics on an enormous scale, compiled with the exactest care by men of the first class trained to closest habits of

[1] *Vide* Appendix G.

scientific observation, utterly free from all prejudice, and possessed of a full knowledge of the conditions of the problem. The statistics hitherto published do not fulfil these requirements. They are the reverse of voluminous, and there is internal evidence the compilers have seldom even heard of the long controversy between the followers of Lamarck and Darwin.

We must turn for enlightenment to another line of reasoning. A character acquired by the parent, if transmitted, would appear as an inborn character in the child. Thus, to take an illustration we have already used, if a father were blinded by accident, and his child, *as a consequence*, were born blind, the father's blindness would be acquired, but the child's would be inborn. Inborn traits, as we know, are transmissible to future generations. The increased capacity for enjoying alcohol which indulgence confers is an acquirement. If transmitted, it would appear in the offspring as an inborn trait, and would tend, as a consequence, to be inherited by succeeding generations also. In other words, not only would the son be affected by the drinking of the parent, but future generations as well. It is plain, on this hypothesis (*i.e.* that parental drinking increases the child's predisposition to drunkenness), that the effects of drinking would accumulate generation after generation — each succeeding genera-

tion being rendered more and more inclined to drunkenness by the drinking of preceding generations. The son would inherit his father's capacity for delighting in alcohol, *plus* the increment caused by the father's drinking. He would make a different start in life, in that he would begin with a greater proneness to drunkenness than the father began with. The grandson would start with the son's initial proneness, *plus* the increment caused by the son's drinking. This process, repeated for many generations, would evidently render the race so very inclined to drink, and, as a consequence, so very drunken, that, given the opportunity, it would drink to extinction.

I understate the case however. For the son, owing to his greater capacity for enjoying alcohol, would, as a rule, drink more than the father, and therefore transmit a greater increment of the predisposition to drunkenness to the grandson than the father transmitted to him. The same would happen in succeeding generations. The proneness to drink would, therefore, increase, not in arithmetical progression, but in a sort of geometrical progression. The race would rush to ruin. In a very few generations it would become extinct. Exactly the same would happen did parental alcoholism produce filial degeneration.

On the other hand, if the Lamarckian doctrine

be untrue, if parental drinking does not increase the child's proneness to drunkenness, the result must be quite different. Alcoholic selection is very stringent. The children of drunkards, who, if they survive, inherit, as a rule, the parental character, and tend in turn to be eliminated by drink, are generally placed under conditions much less favourable than those which surround the offspring of more temperate individuals. They are neglected and ill-nourished; they live in poorer and less sanitary homes. As a consequence they perish in greater numbers. Very frequently the worst alcoholics—those who have quickly and violently developed the craving for intoxication—do not marry. Indulgence ruins their appearance, and renders them mentally and physically unattractive to the opposite sex. Men and women, from prudential motives, object to ally themselves to known inebriates. Male drunkards are very apt to satisfy their sexual cravings by intercourse with an unfortunate and very sterile class of women, who are often unfortunate because drunken. Deaths indirectly attributable to alcohol, therefore, swell the total of those directly attributable to it, and to their sum must be added all those offspring which drunkards might have, but do not have. If, then, the Neo-Darwinian doctrine be true, a race afflicted by alcohol should, by the weeding out of the unfit,

tend to become less and less prone to excessive indulgence. Age after age, generation after generation, it should become more and more temperate.[1]

Here, then, is a method by which we may discover the effect, *if any*, that parental drinking has on offspring. If we find that races grow increasingly degenerate or prone to intemperance the longer they use alcohol, then we may accept as proved the doctrine that parental drinking is through heredity a cause of filial degeneration or insobriety. But if, on the other hand, we find that races grow increasingly sober under the influence of alcohol, we must accept as proved the contrary assumption. In that case the most voluminous of statistics ought not to alter our decision. Such statistics do not at present exist. Only a popular superstition and a few vague and ill-digested guesses by medical men exist. But did they exist, so difficult is their compilation, so surrounded by innumerable causes of

[1] The writer has heard it argued that alcoholic selection should render a race more resistant to alcohol, should enable the members of it to imbibe larger and larger quantities without injury. But in the presence of abundant supplies of the poison, alcoholic selection can hardly result, to any great extent, in an increased power of drinking without injury, for under such circumstances the inebriate would simply drink more, and thereby poison himself as effectually as a less-resistant person would with a smaller quantity. There is, besides, no evidence that Italians, for instance, can imbibe larger quantities of alcohol without injury than Australian Blacks, who have never used alcohol till recently.

error, so great is the liability to confuse *post* with *propter hoc*, that they would be unworthy of credence. We should have to suppose that they were founded on bad or insufficient observation, or on bad reasoning, or on both.

CHAPTER IX

THE HISTORICAL EVIDENCE

The Jews, Greeks, Italians, Spaniards, Germans, English—Polynesians and Africans—Other savages—The increased *per capita* consumption in France—Fallacy of reasoning from the *per capita* consumption—Predisposition to inebriety arose in man apart from the use of alcohol—Alcoholism a "disease"—Civilisation impossible in the absence of alcoholic evolution.

LET us now quit *a priori* reasoning and turn to the actual facts. *A priori* reasoning, confirmed by facts, is a very valuable means of advancing scientific truth. Unsupported by verifiable evidence, it is apt to lead into a very quagmire of error. What then are the facts? Some races have been afflicted by cheap and abundant supplies of alcohol for thousands of years, for example, Greeks, Italians, Spaniards, and Portuguese. Others have been less afflicted for a shorter time, for example, all North Europeans. Yet others have had little or no experience of alcohol, for example, most savages. Of all peoples, to whom alcohol is accessible, the most temperate are those who have been most

afflicted by it, the least temperate are those who have had little or no experience of it. *Every race, in fact, is temperate strictly in proportion to its past sufferings through alcohol.* The inhabitants of the wine countries, the South Europeans, are notoriously the most temperate in the world. Most savages, when they have the opportunity, are furious drunkards. North Europeans and their colonists lie between the two extremes. They are more drunken than South Europeans, and less drunken than savages. Here, then, as elsewhere, the Neo-Darwinian doctrine is decisively confirmed by an appeal to facts, whereas the Lamarckian hypothesis, founded as it is solely on *a priori* reasoning, again breaks down utterly.

There is, besides, ample testimony that races, which have long used alcohol, were anciently more drunken than at the present day. The Jews are a case in point. Warnings against drunkenness are common enough in the older Scriptures, but they grow rarer till they practically cease in the New Testament—or rather, in the New Testament they are addressed almost solely to Gentiles. When the Jews entered Egypt they were a race of wandering and predatory shepherds, growing no vines, and drinking no wine except such as they captured or purchased. After leaving Egypt, during the wanderings in the wilderness, they had few

opportunities for drunkenness. But, when they settled in the Promised Land, every man dwelt beside his vineyard; and, from that day till the coming of the Romans, whoever among them craved greatly for drink, had ample opportunities of poisoning himself with it. Even since the Roman Conquest the Jews have dwelt mainly in the vine countries. With what result? A drunken Jew is an exceedingly rare phenomenon at the present time. No doubt one may occasionally hear of a Jew getting drunk.[1] But a Jew drunk is not necessarily a drunken Jew, *i.e.* an habitual drunkard. Very few Jews are abstainers except on medical grounds; and they have a feast, that of Purim, occurring in the month of April, when drunkenness is not only permissible to them, but is absolutely encouraged. Now Jews dwell in all climates, they drink alcohol in all its varying degrees of strength, they are exposed to all manner of educational influences, some of them are extremely rich and some are excessively poor; some, as in Russia and Morocco, are half savage; others, as in France and England, are highly civilised. But under every condition they are sober, plainly not because they resist temptation, for as a race they are not particularly given to

[1] The author has in his possession a letter from Professor Brinton, the American Anthropologist, in which the writer states that he never heard of a case.

austerity, but through inclination; because deep indulgence, so far from being delightful, is disagreeable to them. The present writer has never medically treated a Jew for alcoholism, and he has never heard of one being so treated. The following is emphatic testimony from an author who would disagree strongly with the views set forth in this volume:—

"That Sunday closing is but a tiny factor in promoting sobriety is demonstrated by the sober conduct of the East End Jewish people. Their Sunday is our Saturday, I have worked among them and have known thousands. I cannot recall a single case of drunkenness among them, nor have I treated any of them for a disease in any way attributable to alcoholic indulgence. I have, on the other hand, treated many a drunken man in Scotland, even on a Sunday."[1]

Other races supply evidence as convincing.

"In Greece in past ages inebriety was more common than at present; the wine was stronger and perhaps not so pure. The ancient Grecian was therefore regulated and penalised for excess. Some law-givers prohibited the use of more drink than was necessary for health. Some sages restricted to three cups, one for health, one for cheerfulness, and one for sleep; Lycurgus, the Spartan, prohibited drinking except for the specific purpose of quenching thirst. He cut off the legs of drunkards and destroyed all the vines he could. Solon condemned an archon to death for being drunk, and the Senate of Areopagus penalised men for standing too long at the wine bar. Pittacus, the sage of Mytilene, inflicted double punishments for a crime committed

[1] "Inebriety among the Ancients," pp. 58-9, W. L. Brown, Medical Magazine Company.

in drink. Nowadays the Greek drinker is not held responsible, and the vice of drunkenness is at present very rare in Greece. . . . If the wine was not so strong as some of our modern drinks, the ancients made up for that in quantity. It was considered something of an honour to be able to imbibe largely, without injury. Wagers and contests were indulged in, and prizes were given to the competitors who could drink most. At one match, Alexander the Great gave a talent as the first prize to one Promachus, who at one of these matches was declared the winner after drinking four congii (eight quarts) of unmixed wine. The results of the contests were disastrous. Thirty of the competitors died on the spot, and six succumbed in their tents shortly afterwards ('Athenæus,' bk. x. chap. 10). It is said also that Alexander the Great, headstrong and contemptuous of the advice of his physicians, a victim of ague, is the most dreadful example in history of the fatal results of the sudden results of the distention of the stomach by large draughts of strong drinks. Alexander dropped dead in Babylon at the early age of thirty-two (B.C. 323), while engaged in a drinking bout with his 'drouthy' but better-seasoned friend Proteus ('Athenæus,' bk. x. chap. 9). If the great ones of the ancient world were so honoured for their prowess in drinking, the imagination can well supply the features of the habits and aspirations of the lower classes."[1]

In the pages of Petronius, Pliny, Gibbon, and other authors we may learn that ancient Italy sinned as much against temperance as ancient Greece. Of the alcoholic history of the ancient Spaniards and Portuguese — to-day as temperate as the Greeks and Italians—the writer has been able to gather little. There is, however, this interesting and significant fact. The Teutons of

[1] "Inebriety among the Ancients," pp. 19, 20, W. L. Brown, Medical Magazine Company.

old were exceedingly drunken. An immense horde of Visigoths conquered the Iberian peninsula and settled there. Presumably they were as intemperate as other Teutons. At the present time drunkenness is very rare amongst their descendants.

The lowest savages are unable to manufacture alcohol. When a little civilised they are sometimes able to prepare very dilute solutions. Only civilised men are able to manufacture really potent beverages, such as spirits and the stronger wines. Spirits are quite a modern invention. The civilisation of the Mediterranean littoral is extremely ancient. Egypt has a recorded civilisation of 7000 years, and there is not wanting evidence that an advanced state of society has existed in the valley of the Nile for more than double that period. Our oldest records tell of a civilisation in Greece and Italy so high that a period of advancement almost equalling in duration that of Egypt must have preceded it. "Behind dim empires ghosts of dimmer empires loom." The earliest records, even the earliest myths, tell of the use of highly intoxicating wines of many kinds. The number and variety of the intoxicating beverages in turn give evidence of a long established industry, and, consequently, of a long course of alcoholic evolution. We know nothing of the Greeks and Italians at the beginning of their evolution. We first hear of

them when it was nearing its completion. The earliest beginnings of the alcoholic evolution of North Europeans are also hidden from us. We do not know when they first manufactured alcohol, but it must have been thousands of years later than the Greeks and Italians. It is probable that, when the former were still in their stone age, the latter were highly civilised, and were building theatres and temples before the barbarians had learned to make pots and jars—that is, before they had the very utensils in which to manufacture alcohol. Brewing requires considerable skill; the manufacture of alcohol of intoxicating strength from grapes and other saccharine fruits requires very little. Even after the Northern barbarians discovered alcohol, the supply of it must have been very scanty, and its habitual use restricted in great measure to the chief men. They drank mead and ale, which they brewed from honey and grain, articles of food, and food is generally scanty and precarious amongst savages dwelling in cold and temperate climates. At the dawn of history, therefore, the North Europeans, for several reasons, had undergone far less alcoholic evolution than the Southerners.

Long before the barbarians conquered Rome they were noted, even in the Rome of that day, for their intemperate habits. As Tacitus put it,

"intemperance proves as effectual in subduing them as the force of arms." They soon learned the superiority of the wines of the South, and these are said to have furnished not the least of their inducements for the invasion of Italy. On the advent of Christianity vines were planted by the ecclesiastics in Germany and the neighbouring countries.[1] The Holy Sacrament necessitated the use of wine, and the first vineyards of any importance were planted around the great monasteries, such as those near Mayence and Würzburg.[2] As alcohol became plentiful, drinking to excess soon gained a firm hold on the people.[3] In the middle of the eighth century systematic attempts were made to legislate against drunkenness. Charlemagne "forbade suitors or witnesses to appear in court intoxicated, earls to sit in judgment unless perfectly sober, and priests to offer drink to penitents. If any one of his soldiers was found drunk in camp, he was restricted to water as a beverage, until he admitted the heinousness of his offence and publicly implored forgiveness. But these edicts were of no avail."[4] Many succeeding emperors followed in the steps of their great predecessor. For instance, Frederick III., at a Reichstag in Worms, in 1495, ordered "all electors,

[1] Callowitz, quoted by Samuelson, "History of Drink," pp. 103-4. Trubner & Co.

[2] *Op. cit.*, p. 104. [3] *Op. cit.*, p. 104. [4] *Op. cit.*, p. 105.

princes, prelates, counts, knights, and gentlemen, to discountenance and severely punish drunkenness."[1] Karl IV. declared that "the vice is greatly on the increase, that it leads to blasphemy, murder, and manslaughter, and that such vices and crimes have rendered the Germans, whose manliness was so famous in olden times, despised and contemned of all foreign nations."[2]

A temperance propaganda arose among the Germans. "Orders of Temperance" were founded. "Those were not mere associations of the 'moral suasion class.' Some of them were founded and governed by emperors, princes, and counts, others by ecclesiastics or burghers. . . . The records of some of them would delight the heart of a modern suppressor of the liquor traffic from the severity with which they show the rule to have been enforced."[3] Nevertheless, German intemperance became a by-word among the nations. As wine cheapened, and came more and more within the reach of the poorer classes, drunkenness culminated. The low price of wine in 1539 has been commemorated in a proverb—

> "Tausendfünf hundertdreissig und neun
> Galten die Fässer mehr als der Wein."
> ("In fifteen hundred and thirty-nine
> The casks were valued at more than the wine.")[4]

[1] Callowitz, quoted by Samuelson, "History of Drink," p. 104.
[2] *Op. cit.*, p. 104. [3] *Op. cit.*, p. 106. [4] *Op. cit.*, p. 113.

But having reached its culmination, drunkenness gradually diminished in Germany. To-day the South Germans, especially in the vine-growing districts, are as sober as the inhabitants of the Mediterranean littoral.

Great Britain has always been intemperate, and has sought as often as Germany to cure the evil by legislative action. In it, also, as drink gradually cheapened and came more and more within the reach of the people, drunkenness waxed at a corresponding rate. The stringency of selection grew sharper. The culminating point was reached early in the eighteenth century, when tavern signs intimated that customers could get drunk for a penny, and dead drunk for twopence;[1] and when gratuitous accommodation, with clean straw to lie on, was provided in the cellars for those who expended the twopence.[2] A term was set to this great national orgie by Sir Joseph Jekyll's "Gin Act," which became law in 1739. But already there had been a vast elimination of the unfit. Not only did the Gin Act render drink less accessible, but the number of those who desired to be drunken had greatly diminished. Since then the severity of legislation has not much, if at all, increased, but the improvement, begun nearly two hundred years ago, has

[1] Callowitz, quoted by Samuelson, "History of Drink," p. 113.
[2] *Op. cit.*, p. 161.

continued to our day. Some part of it is doubtless due to a moral uprising, especially in certain classes of the community. But, as we shall see, by far the greater part has resulted from evolution. Jekyll's Act checked, but did not stop, elimination. That, even to-day, is enormous.

It is needless to pass the other European countries and their colonies under review. Everywhere we find evidence that the more a people has been afflicted by alcohol in the past, the less does it suffer at the present time. Thus in his "Wealth of Nations" Adam Smith long ago observed that the French of the wine-growing districts were much more temperate than their Northern compatriots.

Savages are proverbially intemperate. They are furious drinkers, and are furious in their drink. Their intemperance frequently takes a more violent and homicidal form than is common amongst modern Europeans, and to that extent hastens their elimination. Doubtless ancient Europeans displayed the same traits. It is only necessary to supply a tribe of Esquimaux or Australian Blacks with a plentiful supply of alcohol to secure their extinction. But there are exceptions. West African negroes have been declared by many observers to be even more temperate than North Europeans.[1] For unnumbered generations they

[1] *Vide* Appendix H.

have possessed a cheap and abundant supply of palm wine, and have, therefore, undergone alcoholic selection. The same is true of some Polynesians. Almost alone amongst savages, these widely separated races have achieved some degree of alcoholic evolution.

It is sometimes argued, since certain nations—the French, for example—are more intemperate to-day than they were a decade ago, that, therefore, there has been no evolution against alcohol. In effect, this argument amounts to a contention that unless we are able to perceive an *even* rate of evolution, we must not suppose that any evolution has occurred. But other things besides the craving for drink influence the amount of drinking. Did the other things, accessibility of alcohol, moral influences, purchasing power, and the like, always remain equal, the argument might have some validity. Since they do not, it is absurd. The course of a river is not judged by watching the eddies in a backwater. In the case of a being, who, like man, has, on the average, only three generations in a century, we must not compare decade with decade, but century with century, or even longer periods. If alcohol were made cheaper or trade grew better in England, or if religious influences and temperance efforts lost strength, no doubt we should become more intemperate than

we are at present. But we should not be so intemperate as our ancestors of five hundred years ago would have been had alcohol then been equally procurable. Similarly, were there a great upheaval of religious enthusiasm we should, doubtless, as did the Puritans, become more sober. But only for a time. To judge of evolution we must watch the sweep of ages, not the fluctuations which occur day by day, or even decade by decade.

It has also been argued, since more alcohol is consumed *per capita* by some South European nations, Italians, Spaniards, Frenchmen, Austrians, and South Germans than, for example, by the English, that the former are more drunken than the latter. But in the South of Europe, where there is no temperance propaganda, nor any need of it, and alcohol is very cheap, wine is the ordinary beverage of the people. It is used by every one for the satisfaction of thirst. On the other hand, in England, where alcohol is dear, and there is a vigorous temperance propaganda, vast numbers abstain altogether, others alternate between drunkenness and abstinence, accordingly as their desires or their fears obtain the upper hand. Multitudes more, owing to poverty, cannot obtain as much alcohol as they desire. "Other things," therefore, are not equal, and the argument as a consequence is fallacious. It would be as reason-

able to argue that, if a party of a hundred men drank a hundred glasses of wine, and another party of five drank ninety-nine, the hundred would be more drunken than the five. The *per capita* consumption of alcohol is very low amongst the Tierra del Fuegians and Australian Blacks; but we cannot on that account reckon them as temperate to a transcendental degree.

Since all races which alcohol has afflicted have grown less and less prone to excessive indulgence, and since all races that have had no previous experience of alcohol are intensely prone to excessive indulgence, it is plain that the constitution of mind which renders excessive indulgence delightful, arose in Man quite apart from the use of alcohol. It was the primitive condition of the human mind, and was the cause of drinking, not, as is popularly supposed, the product of drinking. Indeed it is manifest that it could not have been the product of drinking, since, originally, men would not have drunk unless they had found drinking pleasant. How that constitution of mind arose is not material to our enquiry.[1] The plain fact is that it did arise somehow.

The tendency to drunkenness is frequently spoken of as a disease. The term appears to give satisfaction to the charitable, but is hardly correct.

[1] *Vide* "The Present Evolution of Man," p. 327.

Otherwise, it must be held that all races were originally diseased, and that, while some are still diseased, others have been more or less cured by the use of alcohol — a somewhat paradoxical conclusion. The fact is, however, that this constitution of mind is not a diseased condition. It was perfectly normal in primitive man, and was quite harmless to him before the discovery of alcohol. Afterwards it became exceedingly and increasingly harmful. In the modern civilised world it ensures, in a great number of cases, the elimination of the individual who has it.

Among most savage tribes alcohol in strong modern solutions does not select the fit for survival: all are unfit. It slays without discrimination. But in the ancient world things were different. At first alcohol was manufactured only in small quantities, and in the very weak solutions in which most modern savages are alone able to prepare it. Only those who had the best opportunities of obtaining alcohol could have been eliminated; only those with the strongest craving did get eliminated. Under the circumstances, it was not easy to drink to excess. But, as the methods of manufacturing alcohol improved, the stringency of alcoholic selection increased. To-day South Europeans, and even North Europeans, are able to prosper and multiply, though afflicted by a supply of alcohol

which is practically unlimited in quantity and extremely strong in solution. Evolution against disease followed precisely the same steps. A high degree of civilisation is impossible to any race unless it has previously undergone extensive evolution against certain microbic diseases. Presently we shall see that advanced civilisation is equally impossible to all races which have not undergone as considerable an evolution against alcohol.

CHAPTER X

RACIAL DIFFERENCES

Theories to account for racial differences in drinking habits—Climate—Potency of alcoholic beverages—Civilisation—Education and training—Temperament—Recreation—The theory of alcoholic evolution alone covers all the instances.

RACES, aggregates of men, differ like individual men. Some of these aggregates are infinitely more prone to intemperance than the others. We have sought to account for racial differences by supposing that the different races have undergone varying degrees of evolution. Many other explanations have been hazarded. It is time to take them into account.

Racial differences have been attributed to climate. Because the most sober races of the world inhabit the South of Europe, therefore the warmer half of the temperate zone has been thought to be particularly conducive to sobriety. Extremes of heat and cold, on the other hand, have been supposed to promote drunkenness. But many lands have a climate similar to that of South

Europe. In most cases their aboriginal inhabitants are among the most drunken peoples on earth—for example, the various Indian tribes inhabiting the Southern States of the American Union, the aborigines of a similar zone in South America, the aborigines of South Australia, Tasmania, New Zealand, and many islands of the Pacific. A yet wider view makes manifest the fact that no climate is more conducive than any other to sobriety. Dry heat does not render temperate the Australian Blacks, nor moist heat the natives of South America. Arctic rigors do not conduce to sobriety among the Esquimaux and Tierra del Fuegians. A happy mean did not save the Tasmanians, the Caribs, and the Red Indians. Jews and South Europeans are temperate in all regions of the earth in which they travel or settle. North Europeans are much more intemperate under similar conditions.

Different races consume alcohol in different forms. Some beverages are more potent than others. The varying degrees of racial insobriety have been attributed to the varying strengths of the beverages consumed by the different races. It has been thought that the use of the stronger beverages is more conducive to intemperance than the use of the weaker. No doubt it is somewhat more easy to get drunk on spirits, for instance,

than on wine. But men drink for different reasons.[1] He who desires to satisfy thirst or to gratify taste will scarcely choose spirits as his beverages. He who desires intoxication will not of choice distend his stomach with lager-beer or a light wine. If a race consists mainly of individuals who are so constituted as to find intoxication unpleasant, it will use if it have the opportunity—as it always has—the less potent and better flavoured solutions of alcohol. It will drink to gratify thirst or the taste. If, on the contrary, its units find pleasure in intoxication, it will use, when it has the opportunity—as it sometimes has—the more potent solutions. *A priori*, therefore, people are not drunken because they use strong solutions, but they use strong solutions because they desire to be drunken—or, at least, they use strong solutions because, instead of merely trying to satisfy thirst or taste, they wish to obtain, in however small degree, the effects of alcohol on the central nervous system. Proof is afforded by the fact that savages who have not previously used alcohol, or only very dilute solutions of it, eagerly drink spirits to the point of extreme intoxication when they have the chance. North Europeans are drunk when restricted to the wines of the South, as in the case of English and Russian sailors in southern ports. Welling-

[1] *Vide ante*, pp. 72-5.

ton's army in the Peninsula furnished an historic example. His soldiers were much more intemperate on the country wines than the French, and immeasurably more so than the Spanish and Portuguese. On one or two occasions large captures of wine almost dissolved his army, and at Vittoria the same cause deprived him of some of the fruits of victory. On the other hand, Jews and South Europeans are extremely temperate, even in the cities of the North. Moreover, it is not a fact that the more temperate races consume the more dilute beverages. Savages are very drunken even on the dilute solutions. Thus the natives of Guinea have a cassava intoxicant, of which a debauch of three days is necessary before drunkenness supervenes; yet even on it they contrive to become intoxicated. The English consume three quarters of their alcohol as beer, and less than one quarter as spirits, yet they are much less temperate than South Europeans, whose wine on the average is twice as strong as beer.[1] The sober races of the present day were anciently drunken when their wines were no stronger. The Gothenburg system has substituted beer and wine for spirit in Norway and Sweden. Drunkenness has not declined, but rather increased, of late years.

Racial differences have been attributed to vary-

[1] *Vide* Appendix I.

ing degrees of civilisation. But North Europeans are more civilised, though more drunken, than South Europeans. West Africans, savages of a very low type, are conspicuously more temperate than other savages.[1] It is certainly true that the more civilised races are, generally speaking, the more temperate. But with exceptions,[2] with which we shall deal later, all civilisation has been accomplished at the cost of prolonged alcoholic selection.

Education has been supposed to influence differently different races, making some races more temperate than others. But a question is begged. It does not follow that education accentuates the *differences* between races. It may, and actually does, minimise them. What is there in the education of Jews and South Europeans that renders them so much more temperate than North Europeans? The latter, though their alcohol is dear, have suffered fearfully from drink in recent times, and, as a consequence, have a vigorous temperance propaganda; the former, though their alcohol is cheap, have suffered very little, and have no temperance propaganda. It is frequently claimed, particularly by Jews and by the temperance advocates of the orthodox school, that Jewish sobriety is due to moral teaching. The claim is one of the strangest, especially when made by Jews.

[1] *Vide* Appendix H.

[2] Mahomedans and Buddhists.

Their moral code inculcates other things besides temperance—the ten commandments, for instance. No one will maintain that Jews are as *conspicuously* superior in morals in general—for instance, in sexual and commercial morality—as they are with respect to temperance. If, then, Jews are so teachable as to be temperate through teaching, their moral teaching in other respects evidently must be conspicuously lax. Consider, besides, the miserable Jews of the East End of London. No one will maintain that their environment, their education, is particularly conducive to habits of temperance, yet temperate these Jews are, and to a very remarkable degree.

It must be borne in mind that indulgence in alcohol produces a particular feeling, *a sensation, sui generis.* No amount of education, no sort or kind of education, can convert a pleasant sensation into an unpleasant one. Education cannot change a liking for salt, or sugar, or tobacco, or sexual indulgence, or alcohol, into a dislike for the same thing. Education may induce a moral abhorrence; but the pleasantness of the sensation remains unchanged. Notwithstanding all moral teachings the Hindoo remains capable of enjoying beef, the Mahomedans of enjoying pork, the Buddhist of enjoying animal food, the monk or nun of enjoying sexual love,

the abstainer from moral motives of enjoying alcohol.

The better classes of England have greater opportunities for indulgence in alcohol than the lower, and the penalties they incur are smaller. To a man with a thousand a year the cost of habitual drunkenness is as nothing; to a man with fifty pounds a year it is ruin. Both suffer in health and reputation, but the latter, in addition, reduces himself and his family to destitution. Nevertheless the poor, when they have the opportunity, are generally much less temperate than the rich. It is argued sometimes that the rich have loftier ideals and greater opportunities for "rational" enjoyment. But, again, loftier ideals and rational enjoyments cannot change sensations. If a man, however educated, have the "alcohol diathesis," he still finds pleasure in deep indulgence. I have not heard that the better classes seek pleasure less eagerly than the lower, or that Jews and Italians seek it less eagerly than the English or Scotch. The better classes are not all "intellectuals"; we hear something of "men of pleasure." Even "intellectuals" have been known to be intemperate, and men of pleasure are often temperate. We cannot, by giving a man sugar, satisfy his desire for salt, nor abolish a longing for water with food. Similarly, we cannot sub-

stitute a delight in Shakespeare, or Kant, or Darwin for a craving for alcohol. The sensations, the wants, are utterly and completely different. They may co-exist, but are not in the least interchangeable. Education may supply new delights, but it can no more appease the desire for intoxication than it can appease the desire for warmth. Doubtless reasoners of a certain class will argue that the delight in warmth is "natural," whereas the delight in alcohol is not, and will find in the word a support as solid as Mad Margaret found in "Basingstoke." Natural or not, intoxication produces in men of a particular type sensations as delightful as those induced by warmth, and as little influenced by education. But the question is begged. The pleasure in drunkenness is as natural as that in warmth. The one is called forth by experience of alcohol, the other by experience of cold. All primitive races possess the power of delighting in both. But the one is harmful, the other beneficial; and, therefore, while natural selection is eliminating the one, it is preserving the other.

Education, therefore, does not affect the capacity for enjoying alcohol, but there is this patent fact. The better classes of the present time have, in general, descended from the better classes of former

days—from an ancestry which, owing to its purchasing power, was admittedly drunken, and which, therefore, suffered much greater elimination than the ancestors of the lower classes. Moreover, intemperate families of the better classes furnish recruits to the lower classes, whereas temperate members of the latter frequently force their way into the ranks of the former. The better classes are supposed to exercise greater self-control; but, once again, let me ask my readers of the better classes whether they actually do exercise great self-control? Are they really temperate only because they continually resist a tormenting craving for drunkenness? Is the craving for intoxication in them like a constant thirst or hunger? I think only the exceptional individual will answer in the affirmative. If it were true that moderate drinkers felt this great craving, we should all be abstainers or drunkards. What resolute decent man under such circumstances would dare to drink or offer drink, and thus lead himself, his friends, and his unfortunate children into drunkenness, or into a scarcely less miserable torment, of resistance to urgent temptation.

It is not, of course, intended to deny all influence to education. The Puritans were more temperate than their fathers; the better classes are more temperate to-day than they were a

hundred years ago. In either case the change was too rapid to be wholly attributable to evolution. But under the Tudors and Georges excessive drinking was more or less a fashion. Probably many men drank more than they really enjoyed. Religious fanaticism helped the Puritans. It helps us to nothing like the same extent, but at any rate we are free from the trammels of the fashion. Each of us of the better classes follows his own inclinations, and in most of us the inclination to insobriety is non-existent, or so weak, that we are temperate in spite of every opportunity for indulgence. Whole nations, Jews, Spaniards, etc., are constituted as we are. But amongst us are exceptional individuals who, under identical conditions of life, quickly develop a deep craving for alcohol. Whole nations, Red Indians, and others, are constituted like the exceptional persons. No doubt most men, if they were forced to drink a bottle of spirits every day, would end by relishing the indulgence. At any rate, they would miss deprivation of it. But the important point is that some men would develop this frame of mind much more quickly, easily, and thoroughly than other men. Almost from the beginning the experience would be delightful to them. In others this enjoyment would follow only after a more or less prolonged and disagreeable probation. From the

former class are recruited the drunkards of the better classes; from the latter the sober majority, who under the ordinary conditions of their lives are temperate without effort.[1]

It must be noted that we have under discussion, not abstainers, but drinkers. Undoubtedly many men are abstainers through will-power called into operation by teaching, or by personal experience, a form of teaching. They remove themselves from temptation, and, comparatively speaking, have a very easy task. But the moderate drinker who is temperate by force of will in the face of a great craving, has an infinitely harder part to play. He is rarely met with. It is true that many men who have been somewhat—or to speak more precisely, occasionally—drunken in their youth, in later life are perfectly temperate. But they do not belong to that type which under the ordinary conditions of society finds delight in mere intoxication. They drank for convivial purposes, and when alone or

[1] Occasionally a drunkard appears in a family that has long been temperate, a fact that has puzzled many writers. Usually he is supposed to have exercised less self-restraint than his fellows. As a fact, his predisposition to intemperance has been greater. He has reverted to the ancestral type (*vide* chap. v. and Appendix E.). Under all forms of evolution reversion is common, especially when the antecedent evolution has been recent and rapid. The evolution of the better classes is an affair of yesterday. Moreover, they constantly intermarry with the lower classes, whose evolution is still more imperfect. Hence the frequency of reversion.

with their families were not tempted even in their wildest youth.[1]

Temperament has been assigned as a cause of racial differences. But whence the differences of racial temperament if not through alcoholic evolution? All races had a common origin, and, therefore, had once a common temperament, which, to judge by the analogy of primitive peoples, was of that kind which renders intoxication delightful. They have since diverged widely. In every case the temperate races of modern times have suffered prolonged elimination through alcohol; the drunken races little or none.

Advance what other theory one will, and there are numerous exceptions—which do not, according to the silly saying, prove the rule—the theory of alcoholic selection alone covers all the instances. Hitherto it has been advanced mainly in technical publications. So far as I am aware, it has met with very general assent from biologists. But one or two eminent gentlemen have advanced the luminous hypothesis that a craving for alcohol *may*

[1] Various schemes of temperance have been founded on the belief that if more and better recreation were provided for the poorer classes, drunkenness would cease. Immense good would doubtless result. The sum of human happiness would be increased, and many men on the borderland might be rescued—those whose delight in alcohol is comparatively weak, and who drink mainly for convivial purposes. But the real drunkards who do not seek recreation, but something entirely different, for which recreation is no substitute, mental paresis, would be left untouched.

be no bad thing after all, as *perhaps* it is correlated to, is a necessary accompaniment of, a strong and vigorous character; and that *possibly*, therefore, it is indirectly owing to their tendency to get excessively drunk that the Northern races of Europe surpass the Southern. Of course, on general considerations, I must admit it is conceivable that the alcoholic craving may be allied to a strong and vigorous character, just as it may be allied to any other physical or mental trait—to an enlarged nose, for instance, or to an amiable tendency to collect blue china. And if, dismissing from our minds all the known facts bearing on the question, we are very careful to think only in abstract terms, this proposition may be maintained with a very pretty display of philosophical acumen. But that such speculations have any scientific value, or are other than a species of solemn and fatuous trifling, I am not prepared to admit. I do not know, for instance, that anything is recorded which contradicts the assumption that a tendency to get drunk is correlated to nasal pre-eminence, or to a predilection for *bijouterie;* but very much is known which contradicts the assumption that the alcoholic craving has for its concomitant a strong and vigorous character. Is it in accordance with common experience that inebriates are thus endowed beyond their fellows, or that the lowest

savages transcend in this particular the highest races? The simple truth appears to be that a craving for alcohol has nothing whatsoever to do with strength and vigour of character, any more than has a craving for salt or sugar or pepper.

CHAPTER XI

OPIUM

Parallel between diseases and narcotics—The evolution against opium more easy than that against alcohol. The elimination more thorough from the beginning—The evidence produced before the Royal Commission on opium.

BESIDES alcohol, many other narcotics are used by different races. Chief among them are tobacco and opium. A remarkable parallel obtains between zymotic diseases and narcotics. We have seen that immunity may be acquired against some diseases, but that it cannot be acquired against others. In the latter case—*i.e.* when immunity *cannot* be acquired by the individual—if the disease be death-dealing, a very long and tedious process of selection results in the evolution of inborn immunity. The race grows so resistant that the majority of its members *resist infection.* Consumption is an example. In the former case—*i.e.*, when immunity may be acquired by the individual—the members of the race remain as susceptible to infection as ever; but there is evolved in them

a power of acquiring immunity, of *recovering from infection.* In this way a short cut is provided by which the much more tedious evolution of inborn immunity is avoided. Measles is an example. The worst, the most death-dealing diseases are those against which immunity cannot be acquired. When immunity can be very quickly and easily acquired the disease is seldom fatal. Death from chicken-pox, for example, is very rare—so rare that no evolution has resulted, wherein it is in violent contrast to consumption, against which there has been immense evolution.

Alcohol is comparable to consumption in that little immunity can be acquired against it by the individual. The drinker does not become indifferent, to any great extent at least, to the poisonous qualities of alcohol. It affects him almost as much at the last as it did at the first. He cannot consume greatly increased doses without feeling the immediately poisonous effects—the intoxication. The case is different as regards tobacco. Tobacco is very poisonous to the smoker at first. But, as he becomes habituated to its effects, he is able to tolerate enormously increased doses. He acquires immunity. He can then smoke to his heart's content, generally without remote injury, always without immediate injury. The death-rate from tobacco is therefore extremely

small, and as a consequence there has been no evolution against it. Races which have longest used tobacco are as ardent (but not more ardent) votaries of nicotine as races newly introduced to it. In all this tobacco furnishes a close parallel to chicken-pox.

Immunity can be acquired against measles; but not so easily as against chicken-pox. Measles is therefore the cause of a considerable death-rate, and consequently of evolution. But the death-rate is not so large as that occasioned by consumption, nor is the consequent evolution so tedious and difficult, and therefore so great. Opium furnishes the parallel. It is very poisonous to the beginner—more poisonous than alcohol, just as measles is at first more poisonous than consumption. But the immediately poisonous effects diminish till doses a thousandfold greater than those which were at first poisonous can be tolerated. The opium smoker or drinker becomes more and more immune. But there is a limit to safe indulgence. Unlike the tobacco smoker the enjoyment of the opium inebriate is not always contained within harmless bounds. If he craves greatly for deep indulgence, and as a consequence indulges very greatly, he becomes, like the alcohol inebriate, constitutionally poisoned. Opium is therefore the cause of a considerable death-rate, and therefore, as we shall see,

of considerable evolution. It occupies a position midway between tobacco and alcohol. The protective reaction whereby increased doses can be tolerated, provides a short cut towards immunity. This short cut is not so complete as in the case of tobacco; but, since it exists, the evolution is less prolonged and tedious than that against alcohol. For thousands of years many races have been afflicted by alcohol, and their evolution is not yet complete. The natives of India have used opium for a few hundred years only, and their evolution already appears complete.

There is, besides, this further difference between alcohol and opium. In the beginning alcohol was manufactured in solutions so dilute as scarcely to be poisonous; but the manufacture of opium is so easy that from the beginning it must have been made of very poisonous strength. From the first, therefore, opium selection must have been very rapid and stringent. Races which have no previous experience of alcohol become extinct when introduced to strong modern solutions of it. The fact that the races which use opium have undergone evolution, not extinction, therefore proves the far greater ease of the evolution against it.

The Greeks of the time of Hippocrates were acquainted with the medicinal use of opium,[1] and

[1] "First Report, Royal Commission on Opium," p. 147.

early imparted their knowledge to the Arabs,[1] who in turn introduced the poppy, with the knowledge of its medicinal properties, to India and China ;[2] to the latter country later than to the former, but yet as early as the eighth century. But not till very long afterwards, not till five hundred years or more had elapsed, was the unfortunate discovery made that opium, like alcohol, might be used to produce pleasurable sensations. For some hundreds of years its use as a narcotic has been prevalent in certain parts of India, whence at the beginning of the last century the Chinese acquired the knowledge and the habit of using it, as a consequence of which the famous import trade with India sprang up. The Burmese have had much less experience of the drug ; indeed they have used it extensively only within the memory of living man. If, then, opium has been a cause of evolution, certain peoples of India—*e.g.* the Sikhs and Rajputs—who have longest used it, should be the most resistant to it : that is, should crave least for excessive indulgence in it ; the Chinese should be less resistant, should crave more for it ; whereas the Burmese should be least resistant, should crave most for it.

This is exactly what we find to be the actual case. Numerous witnesses, men scientifically

[1] " First Report, Royal Commission on Opium," p. 147.
[2] *Op. cit.*, p. 148.

trained, who had had the best possible opportunities for observation, declared before the late Royal Commission on Opium that they had never or rarely known opium productive of harm among the peoples of India. On the other hand, numerous witnesses, chiefly missionaries or others connected with different religious bodies, asserted that everywhere in India it was productive of great harm. But as regards this conflict of evidence, I do not think that I overstate the case when I say, that in a question of this sort the evidence of one expert should outweigh that of a dozen enthusiasts, especially when to the cause for which the latter are contending they apply the word "sacred." I am encouraged in this view when I remember how strangely discrepant may be two versions of the same event given by different and opposed bodies of enthusiasts; for instance, the narrative of this or that event in Central Africa as severally related by Protestant and Catholic missionaries when acting in opposition. Moreover, even by the missionaries, opium is said to be injurious chiefly from a "moral" point of view. It is said by them to affect mentally the natives of India and China much as alcohol is said by people of the same type to affect the natives of England. "The moral effect on the heathen seems to be to rob them of all that little moral sense they seem naturally to have, and it turns

them into thieves, liars, fornicators, and it seems to turn them into everything that is bad. I speak now especially of the heathen." [1]

But even if it be proved that opium has the alleged disastrous effect on the morals of the heathen, yet, since the possession of a high moral tone does not appreciably affect the survival rate, this aspect of the matter does not concern us here. It need only be remarked that it is highly unlikely that opium, any more than alcohol, does directly produce such mental effects. Indirectly, through loss of independence, self-respect, etc., it certainly may do so.

On the other hand, some of the scientific witnesses seemed to have erred in the opposite extreme by attributing to opium a *rôle* altogether too innocent in India. It cannot be that it is entirely harmless there, for, however resistant evolution may have rendered the mass of the people, there must occur among them some cases of retrogression in relation to opium, just as some cases of retrogression in relation to alcohol occur among the South Europeans—cases, that is, of arrested development, in which the individual in his development does not recapitulate the whole of the life history of the race,[2] but halts at the stage reached by a more or less remote ancestor. But the mere fact

[1] "First Report, Royal Commission on Opium," Rev. F. Brown, p. 50.

[2] *Vide* Appendix E.

that so many highly skilled observers, favoured with splendid opportunities, failed to meet with or observe cases of excessive indulgence, proves how great must be the evolution in relation to opium of the natives of India. The following extracts are, for the convenience of reference, taken solely from the "First Report" of the Commission, but the succeeding reports fully confirm the evidence given in it :—

Sir George Birdwood said :

"I wish here to speak only of my personal observation of the habitual use of opium during my fifteen years' latter residence in Western India. I paid the closest attention to the subject during the whole of the years I was there, and had every kind of experience in relation to it, having at different periods been in charge of the Southern Mahratta Irregular Horse, the 8th Madras Cavalry, the 3rd Native Infantry, the jail and civil station of Sholapore, and the steam frigate *Ajdaha*. . . . Subsequently, and for the remainder of my service, I was attached to the Jansetjee Jejeebhoy Hospital, Bombay, and was in succession professor of anatomy and physiology and of botany and *materia medica*, at Grant Medical College. I was also a J.P. and a visitor of the jails of Bombay, and the year I was sheriff I regularly visited them. Besides this, I was probably more intimately familiar with all classes of the native population than any other European of my generation, while, as an ever active journalist (I was a journalist from the first day to the last of my service in India), I was mixed up in almost every discussion of this sort during my time in Bombay. Well, in all the experience —as here precisely detailed, and capable, therefore, of being checked at every point—I thus had of the indigenous life of Western India, I never once met with a single native suffering, or who had ever suffered, from what is called the excessive use, or from the habitual use of opium; and, except cases of acci-

dental or wilful poisoning by opium, I never knew of a single instance of death from its use; and I have never met with any one who, in his own personal experience, has known a case of death or of injury to health from the habitual use of opium as practised by the people of any part of India proper. I exclude Burmah: I know nothing of it. . . . So far as I can remember, in the printed tables used in Indian civil and military hospitals for the entry of diseases, there is no column for the 'opium habit.' On the strength of my personal experience I should be prepared to defy any one to bring forward, from their personal experience, a single authentic record of death, or shortened life, from habitual opium eating or drinking in India. If any one can, let him, and the means of verifying his or her statement are always, within the current generation, accessible in India." [1]

Sir Joseph Fayrer wrote:

"There cannot be a doubt that, in the great cities of India, in China, and probably elsewhere in the East, the abuse of opium is carried by a certain but a limited number to a great extent, but to nothing like the extent to which the abuse of alcohol—*i.e.* by the English—is carried. It is well known that over large areas of country in India, by tens of thousands of people, opium in moderation is habitually used by the natives. . . . It is said, I believe, by its opponents that the tendency of opium eating is ever to increase—to induce, it may be slow but sure, degradation and destruction. . . . I do not believe this. In the course of many years' experience in India, I have known so many who have been habitual consumers of a small quantity of opium without in any way suffering from it, or without any tendency to increase the habit, that I am unable to agree with those who state otherwise." [2]

In answer to the question—"The general effect of your evidence has been that, from your wide opportunities of observation in India, you have not seen that what is called the opium

[1] "First Report, Royal Commission on Opium," pp. 77-8.

[2] *Op. cit.*, p. 111.

habit has produced widespread and grave moral evils among the population of India?" Sir Lepel Grifin replied: "No, I do not think there is a single resident in India who knows anything on the subject who would possibly say so. I do not think I am singular in my opinion." [1]

Sir William Moore said:

"Well, I came to the conclusion that opium smoking was practically harmless, and that drinking *umal pawnee*, or opium water, was practically harmless. . . . I should wish to draw attention to the fact that insurance societies do not impose a higher rate on opium eaters. With respect to that they are guided by the medical officers of these societies. They were addressed some little time ago in Calcutta and Bombay, and they all gave the same answer." [2]

To the question—"Then you would compare the use of opium amongst these people to the use, the moderate use, of alcoholic liquors amongst ourselves?" Dr Mount replied: "Undoubtedly;" and in answer to the further question—"And quite as harmless?" "Yes, quite; in fact, more so, because a man shows a flushed face and many other indications of familiarity with alcohol, but you could detect nothing of the kind in the case of those who used opium. They were all temperate; I never saw in the whole thirteen years I was living amongst them (and I saw them daily) —they came to me at the out-door dispensary or at the hospital, and as a friend, and I never saw in all that time an opium drunkard." In answer to the question—"Will you explain to the Commission what you yourself have observed as to the evils of the opium habit?" he said: "I never saw any one who exhibited such an amount of misuse of opium, not one in all the whole course of that time, so I cannot speak from personal knowledge." And, again, to the question—"You did not see any sufferers from opium?" he replied: "No, not one." [3]

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[1] "First Report, Royal Commission on Opium," p. 108.
[2] *Op. cit.*, pp. 71-2. [3] *Op. cit.*, p. 75.

It is clear, then, that those races of India which use opium are very highly resistant to it. As regards China, while competent witnesses frequently declared that the accounts given by missionaries of its evil effects are exaggerated, it is significant that none of them appear to have declared, as so many did of India, that opium smoking is totally unattended by harm.

Sir Thomas Wade said:

"No man who has lived the time I have in China, and who has been in contact with Chinese of all kinds, can deny that the excessive use of opium in that country is an exceeding misfortune to that country, and I myself have stated that proposition perhaps more positively years ago than I should be prepared to do at this moment—that is to say, that without at all pretending to abate the statement that many people—many thousands of people—do suffer from the excessive use of opium, it is to a great number of people precisely what the use of alcoholic stimulants to the people in our country taken moderately is; that is to say, that it will cheer the workman just as our workman is cheered by his glass of beer."[1]

In an article quoted before the Commission, Dr Ayres wrote:

"My opinion is, that it (opium-smoking) may become a habit, but that the habit is not necessarily an increasing one. Nine out of twelve men smoke a certain number of pipes a day, just as a tobacco-smoker would, or as a wine- or beer-drinker might drink his two or three glasses a day, without desiring any more. I think the excessive opium-smoker is in a greater minority than the excessive spirit-drinker or tobacco-smoker. In my experience,

[1] "First Report, Royal Commission on Opium," p. 87.

the habit does no physical harm in moderation. . . . I do not wish to defend the practice of opium-smoking, but in the face of the rash opinions and exaggerated statements in respect of this vice, it is only right to record that no China resident believes in the terrible frequency of the dull, sodden-witted, debilitated opium-smoker met with in print, nor have I found many Europeans who believe that they ever get the better of opium-smoking compradores in matters of business."[1]

It is clear then that while most of the Chinese—at any rate the Chinese of the Coast, who have been familiar with the poison for some two centuries—do not, as a rule, indulge in opium to excess, yet an appreciable number do take it in such amounts as to place themselves at a disadvantage in the struggle for existence. Probably in inland districts, to which opium has more recently penetrated, excessive indulgence is much more common.

Lastly, there is a consensus of opinion that indulgence in opium is extremely harmful to the Burmans, who have only recently acquired a knowledge of its use.

In reply to the question—"Can you give us the reasons which, in your judgment, actuated the Burmese authorities, and led to the decision to prohibit the use of opium?" the Rev. J. S. Adams, a missionary, said: "From conversation that I had repeatedly with Burmese elders, with the Governor of Bhamo, and with the Buddhist Archbishop, I learned that the principal reason was that the people themselves were so weak in the face of such temptations as those offered by opium and liquor, and also that the Buddhist law prohibited the use of intoxicants to the people

[1] "First Report, Royal Commission on Opium," p. 139.

of the Buddhist faith; and there were also ancient laws of the kingdom of Ava which forbade the same thing."[1]

And to the question—"Can you give us your impressions as to the effect of the use of opium upon the people with whom you were brought into contact in Burmah, whether Chinese or the Burmese?" he said: "Of the four races, I found in Upper Burmah, Kachyins, Shans, Burmans and Chinese, the Burmese were the more decidedly susceptible to the influence of the drug undoubtedly. The Chinese seemed to resist the influence of it more than even the Hill-men, but in all cases where the habit was once formed the emaciation of the consumer, and the deterioration of his moral character alike ensued."[2]

To the question—"You have been speaking thus far of the regulations which were established by the native government of Burmah with reference to the suppression of the opium habit. When the country passed under the rule of the Government of India, what was the policy then adopted with reference to opium?" he replied: "The Government of India made a very important proclamation in English, Burmese, and Chinese, to the effect that Her Majesty, the Queen-Empress, would not receive a revenue from the sale of opium in Upper Burmah, and a law was put upon the Statute Book, making it penal to sell opium or any of its preparations to men of the Burmese race. At the same time, the possession of opium or liquor by Burmans was not an offence, but it has been made so during the last year, I believe."[3]

He also quoted the following from a letter written in 1892, by Dr A. T. Rose, an American missionary:

"You must not write our mission indifferent to the opium question; it has been connected with it since the days of Judson and Wade. Thirty years ago I was appointed to write a report on the introduction, increase, and effects of opium in Burmah by the

[1] "First Report, Royal Commission on Opium," p. 24.
[2] *Op. cit.*, p. 24. [3] *Op. cit.*, p. 25.

'British Burmah Missionary Convention.' The elder Hough, Wade, Bennett, and Kincaird were then living on the field. They all affirmed that there was no opium in Burmah before the English came. We laboured with Sir Arthur Phayre, who professed to believe that the Government must introduce opium in order to control and regulate it. As a revenue measure, the introduction of opium is an enormous blunder, for it blasts the vital sources of the revenue, it converts honest labourers into idle thieves and vagabonds. If all the cultivators in Burmah were to take to growing opium, in five years there would not be a basket of rice. I have never known a Burman or Karen to use it who did not go to the bad sharp."[1]

Sir John Strachy said:

"The only country—I cannot say of India because it is as unlike India as Algeria is unlike France—but the only country under Indian administration in regard to which it appears to me that any evidence has been produced that deserves serious consideration, to show that any considerable section of the people has suffered from the consumption of opium, is Burmah. Now it is indisputable that there has been a great body of opinion as to the injurious effect of opium on the Burmese. Two Chief Commissioners, Sir Charles Aitchison and Sir Alexander Mackenzie, both of them men who are entitled to speak on the subject with the highest authority, have concurred in that opinion, and there is no doubt that the same opinion has been held, very generally held, by the majority of the British officers employed in Burmah. Also it seems to have been an admitted fact, that those views are in accordance with those of the more intelligent classes of the Burmese themselves. 'Native opinion,' Sir Charles Aitchison wrote, 'is unanimous in favour of stopping the supply of opium altogether, and no measure we could adopt would be so popular with all the respectable and law-abiding class of the population. In a matter so intimately affecting the well-being of the community,' he added, 'these

[1] "First Report, Royal Commission on Opium," p. 28.

expressions of opinion are entitled to the greatest respect. When practical questions of this kind arise, it may become a duty to yield to the strong and general desire of the people, even when their opinions may appear unreasonable.' Now although I have myself, I must say, failed to discover the facts upon which this belief in the injurious effects of opium on the Burmese population rests, I cannot deny that it was right to yield to this general consensus of opinion on the part of the Burmese themselves, and of the English officers most competent to form an accurate judgment, and to take measures for preventing the sale of opium to Burmese, and their possession of the drug, and this has been actually done through the whole of Burmah. In regard to this question of the consumption of opium by the Burmese, it is, as Mr Batten says, remarkable that the authorities in Burmah seem to have arrived at the conclusion that opium is a benefit to every one in the country except the Burmese themselves. I should like to add, that while there has been this unanimity of opinion in regard to the mischievous results of opium on the Burmese, there has been an equal unanimity in regard to the harmlessness of the practice among the large foreign population, Chinese and Indian, of Burmah. Sir Charles Aitchison writes: 'There are large numbers of the non-Burmese community, constituting, perhaps, the most thriving and industrious section of the population, to whom the drug is a necessary of life, and by whom it is rarely abused. It is impossible to say precisely what the numbers of the Chinese and the natives of India are, but they are probably not less than 200,000. The legitimate requirements of these peoples must necessarily be considered and provided for.' Sir Alexander Mackenzie's views on the point were the same. He objected to any interference with the supply of opium to the non-Burmese population. 'There is,' he said, 'a considerable non-Burmese population of Shans, Chinese, and others who are accustomed to the moderate use of opium, and who consume it without ill effects or with beneficial results.' The Chief Commissioner 'is not prepared to advise the absolute prohibition of the possession or sale of opium in Burmah by

persons of non-Burman descent. Such a step would be an unjustifiable interference with the habits of a large section of the population, and would be quite impossible to enforce. It may be considered to be established beyond question, that there is a legitimate demand for opium among the foreign residents of Burmah, which would exist whether the Government countenanced the use of opium or not, that if Government decided to declare the sale of or possession of opium generally illegal, the demand would be supplied by illicit means, and that the result of any attempt to enforce absolute prohibition of the use of opium would be the loss of a large amount of revenue without any commensurate benefit.' Although, as I said before, I cannot say that I am satisfied that while opium is harmless or beneficial to the Chinese and others, it is poisonous to the Burmese, still I cannot dispute the authority by which that opinion is supported, and if it be correct, I know of only one suggestion by which it can be explained. I believe there is no race of men among whom the demand for one form of stimulant or another does not exist, and it has been held by some—perhaps correctly—that while particular stimulants are harmless or beneficial to some races, they are injurious to others. It is possible that opium, taken even in moderation, may be injurious or a dangerous temptation to a Burmese, although it may be innocent or beneficial to Chinamen or Sikhs, and, as many have maintained is the case, alcohol, taken even in moderation, may be bad for the people of Southern Asia, whilst, similarly taken, it may be good for Europeans. However this may be, Burmah is not India, and it is not reasonable to apply to India conclusions based upon observations made in a totally different country. It appears to me as regards India, properly so-called, there is no evidence whatever to show that in any part of the country the consumption of opium is anywhere a common and crying evil. Of course, I admit that the use of opium may be abused, but I entirely disbelieve that this occurs to any general or dangerous extent."[1]

[1] "First Report, Royal Commission on Opium," pp. 66-7.

A posteriori considerations therefore abundantly confirm the conclusion we came to on *a priori* grounds, namely, that wherever the death-dealing narcotic opium is in common use as an intoxicant, there also it must be a cause of evolution. It is practically harmless to the natives of India, who have used it for some hundreds of years. It is more injurious to the Chinese whose acquaintance with it is much shorter. But the natives of Burmah, who have only lately become possessed of it, take it in such excess, and perish of it in such numbers, that we, the English rulers of the country, are obliged to prohibit the use of opium in Burmah to Burmans alone, while permitting to all other peoples, just as in Canada and Australia we are obliged to prohibit the use of alcohol to the aborigines alone, while permitting it to all others.

CHAPTER XII

THE TEMPERANCE FAILURE

Two methods of Temperance Reform — Nature's plan — The reformer's plan — The failure of Temperance Reform in America—Total Prohibition inapplicable to dense population—Local Option likewise inapplicable—"Safety valves"—The failure of Temperance Reform in Australasia — The failure in Scandinavia—The Gothenburg System.

It appears, then, that there are two methods in operation for the promotion of sobriety. First, there is what may be called Nature's method, the elimination of the excessive drinker. Secondly, there is the temperance reformer's method, the elimination of drink. The two methods are plainly antagonistic, the operation of the one placing the other in abeyance. If drink be abolished the potential drunkard is preserved; if the potential drunkard is to be eliminated it can only be by means of drink. The question then is, Which method ought we to adopt? Which is the more practicable? Which offers the more certain and easy success?

Nature's method has been tried on an enormous

scale, and has everywhere proved successful. But it is slow and exceedingly cruel. The cost is enormous. Humanity pays in millions of lives, and in incalculable misery and degradation. On the other hand, the temperance reformer's plan promises immediate success. Abolish drink, and the plague ceases at once. Two-thirds of the crime and a great portion of the misery of the world will disappear. Which then is the better plan? Surely every one will admit that the temperance reformer's is the better, provided only it be practicable.

But is it practicable? It, also, has been tried on an enormous scale. Every civilised or semi-civilised race has its history of prolonged temperance effort and legislation. Nevertheless to-day the use of alcohol is more widespread and general over the surface of the globe than at any former period. Alcohol is a potent cause of the extinction of many savage races to which it was previously unknown. Every civilised race possesses practically unlimited quantities of it. Amongst the most civilised of all races, the North Europeans and North Americans, it is the main source of poverty and disease. Owing to special causes, with which we shall deal presently, the temperance reformer's plan has achieved an equivocal success among some Buddhists and Mahomedans. But elsewhere its long record is one of failure relieved by a few transient and very

partial successes. We have glanced at the past history of temperance legislation. It will be even more instructive to examine its present position.

Messrs Rowntree and Sherwell have lately published a massive and very admirable volume dealing with the temperance efforts of modern times.[1] The aim of the work is, by comparing the effects of the various methods of Temperance Reform, to discover the best method, or the methods which are best under different circumstances. No one reading it can fail to be impressed with the ability and earnestness of the authors, their monumental industry, and their absolute fairness. They are temperance reformers of the ordinary school. Yet no more damning evidence of the methods they advocate was ever penned.

The principal modern attempts at temperance have been made in North America. The conditions there are especially favourable. The population is comparatively scanty. Isolation from other peoples is more complete than is the case with any other civilised race. Religious sentiment is very strong and has helped to create the zeal for reform. Total Prohibition is now the law in five States of the American Union.[2] It has been tried and abandoned in ten.[3] When the prohibitory laws were passed

[1] "The Temperance Problem and Social Reform," by Joseph Rowntree and Arthur Sherwell. London: Hodder & Stoughton.

[2] *Op. cit.*, p. 119. [3] *Op. cit.*, p. 120.

the number of persons per square mile averaged eighteen in those States which have *continued* Prohibition, and forty-four in those which have *abandoned* it. In 1890 the numbers had increased to twenty-three and ninety-eight respectively.[1] Thus in the States that have abandoned Prohibition the average density of population was four times greater than in those States which have continued it.[2] If the three most densely-populated States in each class be compared, the figures are as more than seven to one.[3]

If, in these fifteen States of the American Union, we compare the proportion of urban to rural population, results even more striking are brought out. In 1890, in the five Prohibition States, not a single town contained 50,000 inhabitants, and only 5 per cent. of the people lived in towns of 30,000 inhabitants and upwards. In the ten States which have repealed Prohibition 19 per cent. of the people lived in towns of more than 50,000 inhabitants, and 23 per cent. in towns of more than 30,000 inhabitants.[4]

Messrs Rowntree and Sherwell add: "The figures are certainly suggestive, and go far towards compelling a conviction of the impracticability of Prohibition in thickly-populated districts. As a matter of fact Prohibition, however successful in

[1] "The Temperance Problem and Social Reform," p. 120.
[2] *Op. cit.*, p. 122. [3] *Op. cit.*, p. 122. [4] *Op. cit.*, p. 124.

rural districts, has invariably failed when applied to important urban centres."[1]

In none of the Prohibition States do the inhabitants dwell under the ordinary conditions of civilised life—the population is as yet too scanty—but before many decades pass they will certainly do so. Westmoreland, the least densely-populated English county, has more than twice as many people to the square mile as New Hampshire, the most densely populated Prohibition State. Lancashire and Surrey have fifty times as many; Middlesex two hundred and eighty times as many. The average density of population for the whole of England and Wales is more than twelve times greater than that of New Hampshire.[2]

In England and Wales there are sixty two towns of more than 50,000 inhabitants, and 41 per cent. of the total population live in such towns. In New Hampshire there is not a single town of 50,000 inhabitants, and only 28 per cent. live in towns of upwards of 8000 inhabitants. The population falls in the other Prohibition States till, in North Dakota, we find the whole of the population is rural.[3]

The conditions in the Prohibition States are, therefore, immensely more favourable to the success of a policy of compulsory abstinence than they

[1] "The Temperance Problem and Social Reform," p. 124.
[2] *Op. cit.*, pp. 248-9. [3] *Op. cit.*, pp. 248-9.

are in England. Nevertheless, not only drinking, but drink-selling is *openly* practised in every town of the Prohibition States.[1] The only effect of the law has been to create a contempt for the law, which must most harmfully react on the respect paid to law in general. The public, and in particular the police, have been debauched.

New York, Chicago, and Boston are each many times larger than Portland, the capital of Maine, the classic Prohibition State. Portland has 41,508 inhabitants; New York, 3,500,000; Chicago, 1,850,000; Boston, 582,463. In 1888, the latest year for which statistics are available, there were forty-two convictions for drunkenness

[1] "The sale of liquor in the city—as one of the present writers quickly found—is both widespread and undisguised. The proof is clear. On the day following our arrival in Portland (*i.e.* August 12th, 1899) we accompanied the British Vice-Consul in a short walk through the central part of the town. A careful study of the most recent official information on the subject (*i.e.* 1892-3) had led us to expect a certain amount of evasion of the prohibitory law, more or less open and undisguised, but we were certainly unprepared for the actual state of things which the walk disclosed. Many of the streets (*e.g.* Centre, India, Fore, and Commercial Streets) seemed literally honeycombed with saloons, scores of which were passed, and several entered by one of the present writers. Except for the fact that there were no liquor advertisements outside or in the windows, there was no attempt at disguise about them. They opened through swing doors straight upon the street, and the word 'push' was in many cases printed prominently upon the door. Those entered had fully-equipped bars, and men were drinking in nearly all of them. The men did not get their drink and leave, but loitered as men are accustomed to do in an English Public-House."—"The Temperance Problem and Social Reform," p. 138.

per thousand of the inhabitants in Portland; in New York thirteen per thousand; in Chicago twenty-three per thousand; in Boston forty-five per thousand.[1] The sale of drink is permitted in Boston, but not in the surrounding areas. Forty-four per cent. of those convicted in Boston were absentees —people who had come to Boston from surrounding Prohibition districts to procure drink.[2] On the face of it, therefore, Portland is much more drunken than larger towns where drink-selling is not prohibited. It must be noted that the police of Portland are not exceptionally active in apprehending drunken persons, as may be seen from the following statement by the Rev. Wilbur F. Bury, Secretary to the Maine Christian Civic League, writing in January 1898:

"Drunkenness is increasing in the State. The imprisonments for drunkenness in Cumberland County in 1892 were 212; the number steadily increased to 988 in 1896. The *Portland Press* of 16th September 1887 published a list of twenty-one drunks who were before the Municipal Court the day before, and the average number of arrests for drunkenness per week is about forty. But the number arrested for drunkenness in no way indicates the number of persons drunk on the streets, for, though the law requires the arrest of all persons seen intoxicated on the streets, only disorderly, quarrelsome, drunken persons are arrested as a rule; and not all arrested are brought into court, as not a few are

[1] "The Temperance Problem and Social Reform," p. 158.
[2] *Op. cit.*, p. 318.

allowed to go free from the lock-up when sobered. In brief, this is the condition of the liquor traffic in Maine."[1]

"The effort of the police—as the City Marshal informed one of the present writers—is restricted to keeping the streets clear. So long as a man is able to go home quietly he is not interfered with."[2]

Throughout the Prohibition States of America the conditions of the towns is everywhere similar to Portland.[3] "The position of things in Maine and other States is not that Prohibition is imperfectly enforced, but that after a long period of experiment, the authorities have deliberately suspended Prohibition by a definite (albeit irregular) system of license."[4] Messrs Rowntree and Sherwell thus sum up the whole situation:

"In view of all the facts, it is hardly matter for surprise that a lurking distrust of State Prohibition as a practical scheme of politics is steadily asserting itself, even in quarters that once were favourable to the system, and that recent elections give evidence of a growing reaction against the law in several of the Prohibition States. That there is such a reaction no one that has followed the history of the experiment at all closely can doubt, and it was repeatedly emphasised by those friendly to the prohibitory law in the course of the present investigations. Nor is it possible to explain it on any other ground than that of the manifest failure of the prohibitory system to achieve the results that were previously claimed in its behalf. The evidence is conclusive that in no

[1] *Zion's Herald*, 26th January 1898, quoted by Rowntree and Sherwell, "The Temperance Problem and Social Reform," p. 159.

[2] *Op. cit.*, p. 160.

[3] *Op. cit.*, Lewiston, p. 180; Bangor, p. 192; Bedeford, p. 194; Augusta, p. 199; Bath, p. 202; Rockland, p. 204; Waterville, p. 204; Gardiner, p. 207, etc.

[4] *Op. cit.*, p. 242.

single State has the law been satisfactorily enforced in the urban centres. On the contrary, its successes have been achieved in sparsely populated rural districts, where the problem to be dealt with is notoriously simple and easier of solution. Under any circumstances, the failure of the system in the towns and cities would be important, but its importance is increased by the fact that in America, as elsewhere, the drift of population is increasingly towards the cities.

"It is, moreover, morally certain that for generations to come this growth of urban districts will continue, and that, led on the one hand by a gregarious instinct which persists through all ages and civilisations, and driven, on the other hand, by the force of economic circumstances, an ever-increasing proportion of the people will gravitate towards the urban districts, and America will tend to become—what England within her narrower limits has already become—a network of towns and cities, whose borders expand under the pressure of an irresistible growth. A method of Temperance Reform, therefore, that is applicable only to sparsely populated rural districts, and is inapplicable to towns and cities, can have but a restricted and diminishing sphere of influence."[1]

If Total Prohibition fails of success what shall we expect from weaker, less strenuous attempts at Temperance Reform, such as Local Option, the Gothenburg System, and the like? Prohibition seeks to remove alcohol altogether beyond the reach of the drinker—to make him an abstainer. Less radical schemes strive mainly to render access to alcohol somewhat difficult and disagreeable. They seek to make men moderate—a harder task. They may, perhaps, diminish the consumption of drink, just as Total Prohibition does. But do they

[1] "The Temperance Problem and Social Reform," pp. 246-8.

diminish the consumption of drink by the drunkard, or only by the moderate man? The latter may be easily deterred. The former will go through fire and water to obtain the satisfaction of his desire.

Local Option has been tried in most of the States of the American Union. It is hardly necessary to enter into details. Messrs Rowntree and Sherwell give full accounts,[1] to which I must refer the reader. Like Total Prohibition, Local Option has partial success in very sparsely inhabited districts. Where the population is denser it fails altogether.[2] It is not enforced in a single large town, except where there is an adjacent "safety valve."[3] Thus, Boston acts as a safety valve to large suburban areas to which it is united by a quick railway and electric tram service. Cambridge, one of its suburbs, is the largest Prohibition city in the States, its population being over 80,000. Since it adopted "No License," the proportion of arrests for drunkenness per head of population has been doubled.[4] Messrs Rowntree and Sherwell state "that no explanation is forthcoming of the great increase in drunkenness."[5] A possible explanation may be that revellers, knowing

[1] "The Temperance Problem and Social Reform," pp. 250-322.
[2] *Op. cit.*, p. 253.
[3] *Op. cit.*, pp. 315-22.
[4] *Op. cit.*, p. 321.
[5] *Op. cit.*, p. 321.

the difficulty of obtaining liquor in Cambridge, make ample provision before leaving Boston.

Canada contains 1.4 persons per square mile, and public sentiment is extremely favourable to temperance legislation. An optional prohibitory law is in force. Since the passing of the Act it has been submitted to public opinion in nine cities and seventy-three counties.[1] It remains in force in one city (Fredericton) and twenty-seven counties. Fredericton has a population of 7000, and drink is procurable in it.[2] It is fair to add that in some provinces, where the Act is not in force, other prohibitive measures take its place. Nevertheless, Canada presents the same spectacle as the United States. Prohibition succeeds to some extent in very thinly populated districts. Where the population is at all dense it fails altogether.[3]

Most of the Australian colonies have a law of Local Option in one form or another. Practically speaking, Prohibition is nowhere enforced.

In New Zealand the existing prohibitory law has been adopted by only one district, Clutha, which is very sparsely populated.[4] It is also enforced in the "King Country," the inhabitants of which are almost exclusively Maoris. The success

[1] "The Temperance Problem and Social Reform," pp. 325-6.
[2] *Op. cit.* p. 341.
[3] *Op. cit.*, pp. 326-46.
[4] *Op. cit.*, p. 362.

of these experiments may be gauged from the following:

"The Maori Chiefs in the 'King Country,' New Zealand, have asked the Government to substitute a limited licensing system for the Prohibition which is in force at present, and under which liquor of bad quality is being sold everywhere. Mr Seddon, the Premier, approves of the proposal. He told a deputation that the Chiefs and the police were unanimous in stating that Prohibition had spread the evil it was intended to exclude. Sly grog-selling is rampant, and could not be stopped. The same thing was going on in the Clutha district, in Otago, where there were no Maoris, and where Prohibition was enforced by popular vote."[1]

"The Clutha Prohibition is not the only one we have had in New Zealand. A Local Option law existed in this colony many years ago. Under its provisions, it was open to the people in any district to vote 'No License.' In the North Seventy Mile Bush, in the Hawke's Bay province, in a township called Ormondville, a man who had drunk himself mad went home one day and murdered his wife and four or five children. Naturally a thrill of horror passed through the district, and when the next Local Option poll was taken the people voted solidly and solemnly for 'No License.' The public-houses in Makotutu, Ormondville, and Norsewood were closed for three years. Did drinking and drunkenness cease? No. The drinking customs of the people underwent a change for the worse; sly grog-selling became rampant, and more liquor was ordered for consumption in that district than ever before or since. In private houses bottles were kept from which any one might help himself, so long as he deposited the requisite sixpence per nip on the mantel-shelf. In more than one instance this led to the woman of the household cultivating a taste for liquor, with the inevitable result that secret dram-drinking led to the downfall of women who would never otherwise have known the taste of liquor. Secret rooms were

[1] *Morning Post*, 29th October 1900.

fitted up as bars, where every kind of liquor was dispensed, and in some of these shocking scenes were witnessed. Meantime, the business of the township suffered, as travellers were compelled to pass on to neighbouring towns to obtain accommodation. Visitors who had been in the habit of spending a few weeks in the bush for health's sake were prevented, for the same reason, from sojourning in the district. Drunkenness and debauchery increased, and, so soon as the prescribed period of Prohibition had passed, the people voted to re-open the hotels. The Clutha people are passing through a similar experience. The stipendiary magistrate of the district has deemed it his duty to report to the Government that sly grog-selling, drunkenness, and debauchery, lying, sneaking, and spying have succeeded where the people had previously been law-abiding and decent. It will be long before regulation will once more hold sway, because not only have the promises made in the name of Prohibition not been kept—they have been proved to be utterly fallacious. Injury has been done where benefit was predicted, and immorality has succeeded to decency of behaviour. As Principal Grant of Canada recently declared, it would be better to return to the drinking customs of thirty years ago than that the degradation existent in Maine should come as a result of so-called Prohibition.

"If we could be persuaded that Prohibition would result in the total abolition of the evils unfortunately associated with the abuse of liquor, there are millions of men and women the world over who would readily vote 'No License.' But every experiment has proved, whether in New Zealand, Australia, or America, that where that which is no crime in morals has been made a crime by statute, you make law-breakers of the people, and the evils of intemperance are accentuated."[1]

The Gothenburg System is in vogue in Scandinavia. It has greatly diminished the

[1] Extract from a letter to the *Westminster Gazette*, from Mr J. T. M. Hornsby, a journalist of Wellington, New Zealand.

consumption of spirits, but with the odd accompaniment that in the city of Gothenburg itself arrests for drunkenness increased from thirty-nine per thousand of population in the years 1875-1879 to fifty-eight per thousand in 1898.[1]

The increase is not due to better policing, for, in point of fact, the actual increase of drunkenness is admitted on all hands, except by brewers and hotel-keepers,[2] who are interested in the sale of beer.[3] Of course, it would be absurd to attribute an increase of drunkenness to decreased faculties for procuring spirits. But, whatever the cause, it is plain that, though the Gothenburg System has prevented, to some extent, the drinking of spirits by moderate men, it has not in the least restrained excessive drinkers from drunkenness. The latter have turned from spirits to beer and wine, thus once more illustrating the fact that the strength of the solutions used has no influence on sobriety.

In Norway, also, there has been a considerable increase of drunkenness in late years. Means have been found to evade, not the law, but the object for which the law was framed. Less spirits are sold. Moderate men, perhaps, drink less alcohol than formerly. Excessive drinkers drink more in the form of wine and beer.

[1] "The Temperance Problem and Social Reform," p. 461.
[2] *Op. cit.*, pp. 463-4. [3] *Op. cit.*, pp. 495-8.

CHAPTER XIII

THE SOLUTION OF THE PROBLEM

Civilisation inimical to the Temperance Reformer's method—A relic of barbarism—The fundamental errors of Temperance Reformers — Temperance Reform impossible from the biological standpoint — Can only aggravate the evil — A Sisyphean task—The true remedy—The obstacle imposed by man—The alternatives.

THE long record of temperance failures, beginning with the thousand partial and temporary successes of former times, and ending with the total and immediate failures of the present day, demonstrates the increasing futility of all schemes of Temperance Reform that depend for success on the diminution or extinction of the alcohol supply. They are all anachronisms. Legal attempts to enforce moderation, such as the Gothenburg System, have proved farcical failures. Local Option has met its very scanty measure of success solely in very sparsely inhabited colonial districts, and then only when public opinion has been especially favourable. Total Prohibition is wholly impracticable in every civilised country under the sun. It may be taken as a broad fact that civilisation is inimical to all

forms of restraint. Autocratic government, fanaticism, and isolation are accompaniments of barbarism. Individual freedom, intellectual toleration, and wide intercourse with distant nations characterise higher states of society. It was perhaps possible for Charlemagne to enforce moderation. To-day the legal enforcement of moderation is quite impossible. The Mahomedans and Buddhists have enforced abstinence with some success; but at a heavy cost. I doubt whether the most rabid reformer would willingly pay the price for Prohibition that Mahomedans and Buddhists have paid. The same influence, religious fanaticism, which has rendered them sober, has rendered them barbarous also. By limiting intercourse with more free and enlightened, if more drunken, people, and enforcing it by such means as the pouring of molten lead down the throats of the drunken, they have, in some measure, rendered Prohibition possible. But who would pay that price? Archbishop Magee's saying occurs to me: "I would rather see England free than sober." We should have to manufacture a new religion which, unlike Christianity, forbade alcohol.[1]

[1] Notwithstanding the fanaticism of Mahomedans and Buddhists, the secret and even open use of alcohol is by no means uncommon amongst them. The Persians, for example, have been addicted to drink for many centuries. Moreover, Mahomedans and Buddhists have substituted opium for alcohol.

Two fundamental errors underlie the assumptions of temperance reformers. They believe (1) that self-control is a principal factor in the causation of sobriety, and (2) that parental drinking renders offspring more prone to drunkenness than they would otherwise be. We need not discuss the latter point again. It has not a tittle of supporting evidence, and its logical conclusion is the exploded Lamarckian doctrine — if parental drinking so affects offspring that, as a consequence, they are more drunken than they would otherwise be, the races that have longest used alcohol should be the most drunken of all; the contrary is the fact. But we cannot too much or too often insist that the belief that self-control is a principal factor in the causation of sobriety is founded on absolute error. Not self-control, but lack of desire, is the principal factor. If once this all-important truth be firmly grasped, it will be seen that the situation is radically different from that imagined by temperance reformers, and that the remedy likewise must be different from the one advocated by them.

In this instance, as in so many others, men have thought too much in abstract terms. Parrot-like, they have repeated the cry of "self-control," without pausing to consider the concrete cases with which they are surrounded. At the cost of reiteration, but for the last time, let me beg my reader

to judge by the light of his own experience. When he refuses a third or fourth glass of wine, why does he do so? In the great majority of instances surely not because he is fighting temptation, but only because, like "the taste of sweetness, whereof a little more than a little is by much too much," the wine would awaken sensations which, on the whole, are unpleasant to him. The majority of his friends and acquaintances, the members of his household, the men and women he meets in society, or with whom he has business dealings are constituted like him. Obviously, they are temperate without effort, or with very little effort. They are quite unlike the miserable beings instanced by Professor William James.

"The craving for drink in real dipsomaniacs, or for opium or chloral in those subjugated, is of a strength of which normal persons can form no conception. 'Were a keg of rum in one corner of a room, and were a cannon constantly discharging balls between me and it, I could not refrain from passing before that cannon in order to get that rum.' 'If a bottle of brandy stood on one hand, and the pit of hell yawned on the other, and I were convinced I should be pushed in as sure as I took one glass I could not refrain.' Such statements abound in dipsomaniacs' mouths. Dr Mussey of Cincinnati relates this case.

"A few years ago a tippler was put into an almhouse in this State. Within a few days he had devised various expedients to procure rum, but had failed. At length he hit on one which was successful. He went into the woodyard of the establishment, placed one hand upon the block, and with an axe in the other struck it off at a single blow. With the stump raised and stream-

ing he ran into the house and cried: 'Get some rum. Get some rum. My hand is off.' In the confusion and bustle of the occasion a bowl of rum was brought, into which he plunged the bleeding member of his body, then raising the bowl to his mouth, drank freely, and exultingly exclaimed, 'Now I am satisfied!' Dr J. E. Turner tells of a man who, while under treatment for inebriety during four weeks, secretly drank the alcohol from six jars containing morbid specimens. On asking him why he had committed the loathsome act, he replied: 'Sir, it is as impossible for me to control this diseased appetite, as it is for me to control the pulsations of my heart.'" [1]

Between such miserable beings, examples of extreme reversion, and the Jewish residents of the East End of London, who are temperate under peculiarly difficult circumstances, lie all shades of drinkers. Some resemble the "awful examples" of Professor James, others more nearly resemble the East End Jews. The upper classes of England in this one respect approximate more nearly to the Jews than do the masses.

All the civilised world over men are drunken or temperate in proportion to their delight in alcohol. Coercive measures have proved useless everywhere. Nevertheless, the hopes of reformers continue as strong as they were a thousand years

[1] "Text Book of Psychology," pp. 439-40.

"I had a good instance of the strength of the drink-crave in South Africa. My Kaffir surgery boy (aged 14) would steal spirits when he could, but when he couldn't he drank Tinct. Columb. and Tinct. Gentian C°.! Unfortunately, not Tinct. Nucis Vomicis."—*Letter to the Author from Dr H. Laing-Gordon.*

ago. Uninstructed by the past they still hope for success. Clearly success, even temporary success, has become impossible. Permanent success was never possible. But let us for the sake of argument, and for the moment, admit that prolonged success is possible. Let us suppose that through an immense upheaval of public opinion, of a strength and unanimity hitherto unknown among civilised peoples, it is possible to enforce Prohibition by laws so stringent and efficient that they are also quite unknown. Let us make this great concession, and let us even suppose that this law could be maintained for ages. What then? The result would be disaster on an enormous scale. The price in lives and misery would have to be paid with compound interest.

Including the British, all races which alcohol has afflicted have plainly undergone evolution, protective evolution. They began their experience with a great proneness to drunkenness, but have ended with a lesser proneness. But a race which has undergone evolution does not mark time when the eliminating agent, which caused the evolution, is withdrawn. It reverts with a rapidity, proportionate to the previous evolution, to the ancestral type. If, therefore, Total Prohibition, the reformer's ideal, were enforced, and drunkards were no longer

eliminated, a race which had undergone alcoholic evolution would degenerate towards the ancestral type, and become increasingly prone to drunkenness.[1] If the Prohibition were continued long enough, that primitive condition would be reproduced in which the proneness to drunkenness was as great as it is among those modern savages who have never commanded an appreciable supply of alcohol. We have seen that alcoholic evolution is possible to primitive peoples only when the supply of alcohol is scanty and dilute, as, judging by the analogy of modern savages, it must have been in the ancient world. With the strong and plentiful alcohol of modern civilisation the death-rate of primitive peoples becomes so high that they undergo, not evolution, but extinction, as has happened times and again in the Western Hemisphere. To be beneficial, therefore, Prohibition must be eternal. It must endure as long as the human race endures. Temporary Prohibition can result ultimately in great disaster, in greatly increased drunkenness only. In the face of an increasing capacity for enjoying drink, how could we secure this immortal permanence for a mortal law? What guarantee is theret hat a future generation of alcoholic degenerates would not repeal it? It is possible that

[1] In like manner, the negroes of North America must in time lose their powers of resistance against malaria.

in Great Britain, where the majority do not crave intensely for alcohol, but where much misery is inflicted by it on the minority, a self-denying law enforcing Prohibition might be passed. But in the grape countries, where the evolution has been greater, little misery is now inflicted on the inhabitants. Wine is used almost solely as a beverage, not as an intoxicant. It is highly improbable that such races would ever pass a self-denying ordinance merely to benefit foreigners. Under such conditions how could we prevent our thousands of travellers and sailors from acquiring the craving, and seeking means of gratifying it at home—if nothing else can be got, men will drink methylated spirits. Alcohol is necessary to many of our industries, arts, and sciences; must we abandon all of them? Even if Prohibition involved the whole world we could not eliminate sugar nor the microbes which produce alcohol from sugar. In other words, the means of production would remain. Any one who had fruit could manufacture alcohol of intoxicating strength. Prohibition is therefore impossible as a permanent policy. It may be argued that as yet it has been successful with Mahomedans and Buddhists. As yet! we have still to learn the future of those races.

Temperance reformers have therefore under-

taken an impossible, because Sisyphean, task. They have failed because they have entered into a contest with Nature. Metaphorically speaking, they are striving to breed a long-tailed variety of dogs by carefully preserving all the short-tailed individuals and pulling vigorously at their tails. They are trying to promote temperance by preserving the pre-disposed to intemperance, and haling them by moral and legal methods into sobriety. They seek to live on capital; to promote our happiness, but to promote it at the expense of the happiness of our descendants. Unconsciously reversing the maxim attributed to the Jesuits, they have done good that evil may follow. They may achieve some small temporary successes, may benefit us at the expense of posterity — but they cannot possibly be permanently successful; for the use of alcohol cannot be banished from the world, and the craving for it—or, to speak more precisely, the predisposition to it—would, through reversion, gather head in the race, till, like an obstructed mountain stream, it burst all barriers, when the last state of the race would be worse than the first.

It follows that every scheme for the promotion of temperance which depends for success on the abolition or diminution of the alcoholic supply, Total Prohibition, Local Option, the Gothenburg

System, etc., is, in effect, a scheme for the promotion of drunkenness.

Must we then fold helpless hands, and, watching the work of Natural Selection, lift not a finger to save the victims, among whom may be the most gifted of the race, and perhaps even our best beloved? Is there no way by which we, of our own efforts, can render the race more temperate except at the expense of posterity. There is a way; but not in our time will it be followed. It is in our power to aid most actively; but, as yet, the "moral" sense of this half-civilised community forbids. Nevertheless, in the overcrowded world, which looms in the immediate future, our descendants, if spared by temperance reformers, will surely adopt it, and, breeding only from the best, solve this and other kindred problems. It is in our power by copying Nature, by eliminating not drink but the excessive drinker, by substituting Artificial for Natural Selection, to obviate much of the misery incident with the latter, and thus speedily to evolve a sober race.

The difficulties we should then have to face are not imposed by Nature, but by Man, by what we are pleased to call our "moral" system. We cannot alter human nature by laws or moral codes, but we can alter it by careful selection. How shall we eliminate drunkards? By what method? By

poisoning them or permitting them to poison themselves with alcohol? Of course not.[1] By confining drunkards as the insane and lepers are confined? Drunkards are so many that the State could not bear the cost. By forbidding drunkards to marry? It would be futile; drunkenness often develops after marriage. How then? There is only one way. By preventing drunkards from reproducing their like—by forbidding the procreation of children by them. If drunkards were taken before magistrates, sitting in open or secret session, as the accused preferred, and, on conviction, were warned that the procreation of children would subject them to this or that penalty, say a month's imprisonment, the birth-rate of drunkards would certainly fall immensely. Of course many would escape the meshes of the law. But that is an argument against all laws. This law would be more perfect in its operation than

[1] I suppose nothing I can say will prevent some critics from declaring that I propose free drunkenness as a remedy for intemperance. It must be admitted that the statement is rather easy to make, and, when made, may be very effective with people who read the review, but not the work reviewed. Professor Ray Lankester made it in the *Fortnightly* (September 1896, p. 413). Professor Sims Woodhead made it in the *Lancet* (July 29th, p. 259). Both made it when criticising publications in which, at great length, I advocated Artificial Selection. Many other critics, writing in technical journals, have made it. I traced the course of a pestilence, demonstrated the futility of the ordinary methods of sanitation, and sought to provide a remedy. I was promptly accused of advocating the spread of the disease.

any other, for, if the drunken father evaded it in one generation, the drunken son would be taken in the next.

The scheme of Temperance Reform here propounded will doubtless be denounced as opposed to the best instincts of human nature—as horrible, as Malthusian, as immoral, as impracticable. By best instincts people often mean strongest prejudices. The scheme is undoubtedly Malthusian. It is certainly horrible. In a sense it is immoral. It may be impracticable. All that being admitted, let us face the only alternative. The alternative is more horrible and more immoral still. If by any means we save the inebriates of this generation, but permit them to have offspring, future generations must deal with an increased number of inebriates; for, as we have seen, it ever becomes more and more impracticable to extinguish or diminish the supply of drink, or to control drinking. The experience of many centuries has rendered it sufficiently plain, that while there is drink, there will be drunkards till the race be purged of them. We have, therefore, no real choice between Temperance Reform by the abolition of drink, and Temperance Reform by the elimination of the drunkard. The only real choice is between Natural and Artificial Selection—a momentous truth that must constantly be borne in mind. In

this instance, at any rate, we cannot wage successful war against Nature. Whether we help or oppose Nature will do her work. If we oppose, she will cause a maximum of suffering. If we help, since Artificial Selection is so much more swift and certain than Natural Selection, she will do it with a minimum of pain. There need then be no relaxation of temperance effort so far as it involves the saving of individual drunkards, provided always that we forbid children to them. Let us by all means save the individual, but let us also safeguard the species.[1]

Did we abolish drink, we could not discover the drunkard. The above scheme therefore of necessity involves some drunkenness. It is on that account, horrible, but, from the nature of the case, we must in any case have drunkards till no one enjoys being drunk. An ill thing is not rendered worse by being bravely confronted. An unavoidable evil is not made more evil by being turned to good account. By popular decree all Malthusian schemes are immoral. But what the people condemn in public they practise in private, as witness the great and otherwise inexplicable fall in the birth-rate. Malthusianism, however much

[1] It has been suggested to the writer that, since posterity has done nothing for us, we need not concern ourselves about posterity. No epithets can adequately characterise the cruelty and selfishness of this attitude. Our children are dear to us, and their children will be dear to them. Shall we wantonly wreck their happiness?

condemned, is with us. It rests with us to extract what good we can from the evil. Horrible! Immoral! Yes; but we are faced with two horrors, two immoralities, and we are compelled to make choice. Which is the worse; that miserable drunkards shall bear wretched children to a fate of starvation and neglect and early death, or of subsequent drunkenness and crime, or that, by our deliberate act, the procreation of children shall be forbidden them? We are on the horns of a dilemma from which there is no escape. If we do not the work quickly and with mercy, Nature will do it slowly and with cruelty.

Let me ask my readers which is best: to live safe because strong, or to tremble behind fortifications; to be temperate by nature or sober by law? Nature's scheme of Temperance Reform promises immunity from danger. Its success must see every generation increasingly temperate with a sobriety established on a safe and permanent basis. The reformer's scheme promises at best temporary resistance followed by ultimate surrender. Even this poor promise cannot be kept. In the complex modern world in which we live, individual freedom is so great that Prohibition and other forms of restraint merely substitute secret debauchery for open drunkenness. Intemperance is increased, not diminished, by Prohibition.

I care not, then, if the above scheme be denounced as hateful and immoral. All thinking persons will admit that the alternative to it is worse. But if I be told that it is impracticable, I must admit that a great objection is raised. Like all new proposals it is sure to be vehemently condemned, for it deals with procreation, the special fetish of our age and country.[1]

[1] It may be argued that, if it be right to eliminate the weak against alcohol, it must be right also to eliminate the weak against disease, since sanitation against disease preserves the predisposed to disease; and therefore that every scheme for the promotion of sanitation which depends on the diminution or extinction of the microbic supply, is in effect a scheme for the ultimate promotion of disease. But disease and drink stand on a totally different basis. No man craves for disease, and, if we banished it, no man would strive to bring it back; but many men crave for drink, and, did we banish it, increasing thousands would strive to bring it back. Moreover, a human prey is essential to the microbes of such diseases as are non-malarial in type. Their normal habitat is in man during at least part of the cycle of their existence, for which reason these diseases are never contracted away from the haunts of men. Therefore we may hope by improved sanitation, isolation, etc., to utterly exterminate the microbes, and put an end to the disease. But what sane person can hope to exterminate or appreciably diminish the microbes which produce alcohol? Given a sufficient temperature, fermentation occurs everywhere, from the tropics to the pole.

CHAPTER XIV

THE GREAT PROCREATION FETISH

The Tapu System—The Procreation Tapu—The Denunciation of Malthus — The Denunciation of Sir James Simpson — Ecclesiastical midwifery—Law and morals—The contagious diseases — Their encouragement on religious grounds — Human sacrifice—The magnitude of the evil—The Contagious Diseases Acts—Their repeal—The price—The bearing of the fetish on rational Temperance Reform.

When first European travellers and missionaries penetrated to the South Seas, they found in existence amongst the island races a widespread system of Prohibition known as the Tapu or Taboo. All sorts of things, places, men, and acts were tapu—sacred or accursed. Women especially were affected; men in a lesser degree. Many tapus were absurd, but most served the commonweal. All tapus depended on the religious sentiment. The missionaries derided and denounced them as products of barbarism and heathen superstition. They forgot that, though the tapu has not elsewhere received a name, the system has flourished in every land and in every age. They themselves

were hedged about by it on every side. It reaches a higher development in India, where the caste system prevails, than ever it did in the Pacific. Innumerable things are tapu to the Brahmin. We also have our tapus, most of them beneficial, some of them the reverse. Mammalian and avian flesh is tapu to the Catholic on Friday. Sunday is a tapu day, a church is a tapu place, a priest is a tapu person. Above all, everything relating to procreation is tapu—tapu in speech and tapu in act. As a whole the tapu is beneficial. But it is attended with a vast amount of unnecessary, and therefore abominable, cruelty and misery. So strong is this tapu that he who ventures on plain speech about it risks his reputation and his happiness.

Some of our tapus are breaking down. We are permitted to apply the dictates of common-sense and clear reason even to the most fundamental conceptions of religion; but the public insists that procreation shall be dealt with as a thing apart. Concerning it we must think only on irrational lines. It is easy to furnish illustrations.

The sexual tapu bears with especial weight on women. A man may break the tapu many times; if he maintains a discreet silence society will ignore or condone his offence. But when a woman breaks it society pursues her with implacable hate,

apparently only because detection is more easy, or, perhaps it would be more correct to say, only because her offence sometimes forces itself on the attention of society in a manner not to be ignored. Many women more than suspected of immorality hold high positions in society unmolested.

When Malthus enunciated the simple truth that population tends to increase faster than the food supply,[1] a transparent fact known to every student of nature, he was railed at as a criminal.

When Sir James Simpson introduced chloroform no serious objection was raised to its use for the alleviation of pain in ordinary surgical operations. But when he proposed to alleviate the pain of mothers in child-birth the pulpits of Scotland resounded with denunciation. Had not God said to the first mother, "In sorrow shalt thou bring forth children?" How dared this impious being "deprive the Almighty of those earnest prayers, those deep supplications," which arise from the tortured woman in her hour of agony? One is tempted to

[1] "Through the animal and vegetable kingdoms, Nature has scattered the seeds of life abroad, with the most profuse and liberal hand; but has been comparatively sparing in the room and nourishment to rear them. The germs of existence contained in this earth, if they could freely develop themselves, would fill millions of worlds in the course of a few thousand years. Necessity, that imperious all-pervading law of Nature, restrains them within the prescribed bounds. The races of plants and of animals shrink under this great restrictive law; and man cannot by any efforts of reason escape from it."

doubt if it is always God who is worshipped in churches or whether it is sometimes the devil. Simpson answered the fools according to their folly. He declared that the first operation was performed under anæsthesia. "And the Lord caused a deep sleep to fall upon Adam; and he slept; and He took one of his ribs and closed up the flesh thereof."[1]

Occasionally, every obstetrical physician is compelled to choose between the life of a mother and that of her unborn babe. In reality the physician has no choice; if he destroys the mother the law calls it murder. A great religious sect in effect decrees the death of the mother. It seems that being baptised she is eligible for Heaven, whereas her innocent child is not. The doctor who destroys the child commits the most unpardonable of sins; he destroys a soul. Therefore, in practice, the Church ordains that he shall do nothing. The mother and child must both perish. In any case the child perishes unbaptised, and its soul is lost; but in the latter case, though the mother dies in torment, the soul of the doctor is not endangered. It is his duty to watch the woman's sufferings with polite attention, and perhaps to grant her his prayers. The amazing result follows that the

[1] "Life of Sir James Simpson," p. 128, by H. Laing-Gordon, M.D. London: T. Fisher Unwin.

doctors of this sect preserve their souls and their practices by calling to their aid skilled heretical colleagues. A still more amazing result is that the women of the sect, with a tender regard for the souls of their co-religionists and their own lives, prefer to employ heretical practitioners.

The morals of every country are inseparably associated with its religion. British sexual morality, for instance, is founded on Christianity. Non-Christians may of course adhere to the Christian moral code—not because it is Christian, but because they think it is right—but to the mass of the people the code owes its validity to its associated religion. The community recognises two classes of offences—those which are unlawful and those which are immoral. Unlawful offences are generally immoral (*e.g.* robbery); but all immoral offences are not unlawful. Thus, in England, illegitimate sexual intercourse is held to be immoral, but often it is not unlawful. On analysis it will be found that purely moral offences infringe the religious code—the generally beneficial tapu; whereas unlawful offences infringe the secular rights of individuals.

Probably no human being holds in all its details the same moral code (*i.e.* the same ideas of right and wrong) as any other person. The codes of the various Christian denominations differ considerably (*i.e.* as regards the celibacy of the clergy or as regards

divorce); those of non-Christians depart very widely from the Christian standard (*e.g.* as regards infanticide or "vice"). There is therefore no criterion of morals, no tapu, that is valid for the whole human race. Even for Christians there is no absolute criterion, since Christians in different times and places have variously interpreted the Scriptures and advocated very different codes. Only a little while ago our ancestors thought it right to murder heretics; we think it the most heinous of offences.

If the reader thinks a while he will conclude, first, that almost all the greater crimes of history have been committed in the attempt to enforce purely moral ideas, pure tapus, by secular punishments; and, secondly, that almost our whole advance in civilised government has been due to the gradual abandonment of such attempts. For example, again and again during the course of history it has been thought by the adherents of this or that religion that this or that belief was the right one which *should* be held, and that this or that code of morals associated with it was the right one which *should* be followed. The attempt to enforce these ideas led, among other crimes, to the persecutions of the early Christians, to the horrors of the Dark Ages, and in recent times to the Armenian massacres and to the reign

of terror in the Soudan, where the Mahdi made a clean sweep of every one opposed to his moral ideas—to his particular tapu system.

I hope it will be observed that I am not declaiming against moral systems, against tapus in general—not even against the system held by the Mahdi. I am merely attempting to demonstrate that the attempt to enforce such systems by secular punishments has invariably led to crime, and that, for hundreds if not thousands of years, the tendency of legislation in civilised countries has been to leave, more and more, the punishment of purely moral offences to public opinion, which often punishes heavily by social ostracism, while reserving the terrors of the law for offences against the community — for offences, that is, in which one person, by force or fraud, and against the consent of a second person, interferes with the legal rights of the latter. Thus at the present day the law does not punish sexual immorality as such, whereas it does punish adultery, the latter being an offence against the community in that the guilty party breaks a legal contract. Thus, also, we do not punish a plurality of wives in India, nor in England a man (did he exist) with a hundred willing concubines. Since moral codes depend on the associated religions, any attempt to enforce them is essentially an *act of religious intoleration*, and

there never was an occasion when religious intoleration was not productive of more harm than good.

Legislators have gradually, if unknowingly, given effect to these ideas. To God has been given the punishment of offences against God; to man the punishment of offences against man. It has been realised that a correct moral tone cannot be enforced by legal methods, but only by the strength of public opinion; and that the legal enforcement of morals (as such) implies a negation of civilisation. Sexual immorality is *par excellence* a purely moral offence; in other words, it is wrong primarily because our religion declares it to be so, not mainly because it is an infraction of the legal rights of an individual, such as, for instance, are murder, rape, and robbery. As a consequence, the law is no longer set in motion against the immoral. Except among barbarians, the attempt to enforce sexual mortality has been abandoned even by the most extreme of "social reformers." But in England the great procreation tapu comes into operation. "Social reformers" no longer demand that the immoral shall be hanged or burned, or even fined or imprisoned. They recognise that such demands are anachronisms. But they attempt to attain their ends by means that are infinitely more immoral and abominable

than the evils they strive to combat. Put simply, they attempt to render as certain as possible the *poisoning* of all those who offend against their moral code.

We have dwelt on the fact that besides alcohol and opium, the principal causes of human elimination are the zymotic diseases, that is diseases due to living microbes which are communicated directly or indirectly from one sufferer to another. Against all virulent zymotic diseases which are communicated indirectly through the medium of air, earth, or water, and are therefore difficult to control, we take precautions. But against the venereal contagious diseases—the most loathsome of all—which are communicated by actual contact only, and which are therefore particularly easy to control, we take none.[1] If a man has small-pox we isolate him; if he comes from a plague-stricken ship we place

[1] Sanitation is of little use against the air-borne diseases. We cannot disinfect the air. Its volume is too vast, its flow too swift. Scarlatina, measles, chicken-pox, whooping-cough, and influenza are as common as ever they were. Small-pox has been banished only by cutting off the food supply of the microbes, by artificially making the mass of the people immune. Earth- and water-borne diseases are more easy to control; but notwithstanding all our efforts, the race is still plagued by consumption, cholera, enteric fever, and other complaints. But rabies, a contagious disease (*i.e.* one communicated by direct contact only), is so easy to control that it is exceedingly rare. Possibly leprosy should be placed in this category. It also has been banished from England. The venereal diseases, because as easily controlled as rabies, should be as rare. Nevertheless the community is ravaged by them.

him under medical observation. But if he has one of the venereal contagious diseases he is free to communicate it to his fellows—perhaps to the child he kisses or to the friend who drinks from his cup.

What is the result? It is possible that those who talk so glibly of "the State Regulation of Vice" do not fully realise the situation which has arisen owing to the absence of "State Prevention of Disease." Men of the world, and especially medical men, will bear me out when I say that very many Englishmen who reach adult life have suffered from one or more of these complaints;[1] very many innocent Englishwomen are infected also; tens of thousands of helpless infants suffer or perish of them, and England, as regards these complaints, is absolutely the plague-spot of the world. We are the greatest of travellers. With us travel our unchecked diseases. The result is that many an erstwhile flourishing aboriginal race, in the absence of medical treatment, has suffered or is tending towards extinction; and the efforts of other civilised communities to stamp out these terrible diseases are rendered nugatory in consequence of their constant reintroduction from England—whence it

[1] This statement will be disputed by clergymen and others, especially women, who are not in a position to learn the truth. Few young men will speak of their immorality to clergymen, for instance. The statement is true, nevertheless.

happens that the name of Englishman is sometimes mentioned on the Continent with the same kind of shuddering disgust that we accord to a leper.

We are proud of our sanitation, thinking that therein we are the foremost of all races, but, for "moral" reasons, we let loose the venereal diseases till the community reeks of them. We precipitated the great Indian Mutiny by forbidding infanticide in Oude; but of how much vaster proportion is the infanticide in our midst caused by syphilis, a particularly preventable disease. We bear with a heavy hand on poisoners who work by means of drugs. If a man poisons with arsenic and death results, we hang him by the neck; if death does not result, he suffers a long term of penal servitude. But for him who poisons wilfully with venereal disease we have no punishment. We insist merely that he shall do his poisoning in a particularly cruel and treacherous way. It is open to any diseased drab to tempt and poison as many inexperienced boys as she is able. Any scoundrel, knowingly and wilfully, may infect his innocent bride, causing her untold agony or death, and there is no legal remedy. One after another her babies may perish, but, forbidden by our moral code, the law will not stretch that arm which is so powerful against the childish robbers of an orchard. Yet who is there who would not die of

laudanum or of prussic acid rather than of this particular poison? Which of us is there that would not take the life of a sister or daughter with his own hands rather than permit her thus to perish? We send for the propagation of this or that form, it may be this or that preposterous form of Christianity, missionaries to savages in all parts of the world; but at home for "moral" reasons we carefully preserve terrible diseases, which, introduced by us, swiftly exterminate them.[1] Thereafter, with smug pharisaical satisfaction, peculiarly British, but abhorred and derided by the rest of the civilised world, we enter into their inheritance, and render thanks unto God for the favour we have found.

In 1864 a feeble attempt to control the contagious diseases was initiated. Immense numbers of soldiers and sailors were known to be afflicted. The efficiency of our military services, which absorb so many of the flower of our youth, was

[1] India furnishes an example of the extent to which venereal disease is spread by the British. The native soldiers suffer from venereal disease to an extent much less than the British, proving that the complaints are not very prevalent among the population. The venereal disease rate is falling in the British army at home. It should from the same causes (*vide* Appendix J) fall among the white soldiers in India. Nevertheless it is rising at an alarming rate. In some stations more than half the soldiers are permanently incapacitated from this one cause—the explanation being, of course, that the white soldiers are poisoning the population around their cantonments and being poisoned in turn.

seriously impaired. The Acts, known as the Contagious Diseases Acts of 1864, were passed. Prostitutes, who beyond the rest of the community were exposed to, and were liable to, spread infection, were placed under sanitary inspection—just as passengers from a plague-stricken ship, or the inhabitants of a house in which diphtheria has appeared, are placed under inspection. The preventive measures, limited as they were to a few garrison towns, were lamentably inefficient. It was as though rabid dogs had been isolated in Portsmouth and Devonport, but allowed to roam at large in the rest of the country. Under the conditions it was impossible to stamp out the diseases in the garrisons, nevertheless some good was done; the health of the services improved.[1] Thereupon the great procreation fetish was invoked. Fanatical and hysterical men and women perambulated the country uttering misleading phrases, mere claptrap,[2] about the "State Regulation of Vice," by which they meant the State Prevention of Disease; about the "State Recogni-

[1] Appendix J.

[2] "Public meetings were held in most of the subjected districts, and in several large towns, at many of which meetings inflammatory statements were made as to the character and operation of the new law. Most of these statements, so far as they had any foundation whatever, were perversions of the truth; but they had effect."—"Report of Royal Commission (1871) upon the Administration and Operation of the Contagious Diseases Acts," p. 5.

tion of Vice," by which they meant, not the State recognition of vice as an institution, but merely the common-sense recognition of its indubitable existence; not the promotion of vice, but merely the attempt to minimise some of the worst effects of unpreventable vice; about the "Degradation of Woman," by which they meant the placing under sanitary inspection of an already degraded class, who were sowing the diseases broadcast; about the interference with liberty—the liberty of prostitutes to disseminate disease, to wilfully poison, to commit heinous crime;[1] about the danger of confounding the innocent with the guilty, and of blackmailing by the police,[2] as if that did not face us in the case of every other law. It was even stated that the attempt to check the disease had caused the spread of it. It was argued that the isolation of some diseased women left the remainder with a greater power of disseminating it. In other words, it was argued that if we remove one focus of disease other foci have greater scope, (*e.g.* if we remove one case of small-pox, other cases have greater scope) for infection, and the whole amount of disease is greater. The statistics of the period sufficiently disprove this deplorable nonsense.[3] The claptrap "caught on." One-half of the community apparently went mad, and

[1] *Vide* Appendix K. [2] Appendix L. [3] *Vide* Appendix J.

the other half, or a large proportion of it, became afraid. A reign of terror was established. Whoever supported the Acts was denounced as an advocate of impurity, and it was hinted that his action was prompted by his own base ends. Doubtless the accusers hugged themselves in the belief that they also were champions of honour and purity. To-day, when we have war, and are confronted with the hate of half Europe, the support of thousands of trained soldiers is lost to us, and their places are filled with untrained men.

We pay a heavy price for our fetish. Let us now count our gains. What thing of value have we purchased at a price so enormous? Is England any the purer for being honeycombed with disease? The simple fact is that it is as rare for an Englishman as for a foreigner to lead an absolutely continent life between puberty and marriage. Englishmen differ from foreigners only in that they more often contract these diseases, and after marriage communicate them to their hapless wives and children. The great majority of English girls, like other young women, lead lives of absolute purity. Young men know much about these diseases, for as I have said, very many young men suffer from one or other of them; young girls know little or nothing. From this we may estimate the

value of diseases as deterrents from vice. Clearly diseases do not act as deterrents. They are merely instruments of torture. The fearless and even reckless temper of young men should be remembered. When do they in the pursuit of wealth (*i.e.* pleasure) refuse to enter India or the West Coast of Africa, where deadly disease is also rife? Is it probable, then, that the risk of disease alone can restrain them from immorality when placed under exceedingly urgent temptation? It certainly does not. But, unless "social reformers" are able to prove the contrary, what must we think of the party to which they belong, a party directly responsible for more deaths than occur in a great war, for more misery than is caused by foreign conquest? Must we not conclude that this great holocaust of human lives, this vast flood of human misery, is demanded, not in the interests of morality, since morality is not furthered thereby, but solely through a desire for vengeance, the offspring of a wicked and ferocious fanaticism which recks not that the guiltless perish with the guilty.

The fear of disease alone is not sufficient to restrain reckless young men from immorality, any more than it restrains them from seeking their fortune among the deadly diseases of India; but it has been made to loom so large before their minds in this country, that moral considerations

have been quite overshadowed, and pushed into the background. Every sufferer knows that he can contract the most dreaded of these diseases but once; even if cured he need not fear reinfection; he acquires permanent immunity. He is therefore absolutely without restraint if once infected, and becomes a focus for the moral and physical contamination of the community. Far different is the case of the Irish peasantry, who with little disease, are extremely continent, being restrained by moral considerations wholly. Again, though disease does not conduce to morality, it does conduce to a base caution, a fact to which many a wretched girl owes her seduction at the hands of some scoundrel anxious to indulge his passions without danger to himself. Moreover, a horrible superstition is prevalent among the lower and more ignorant classes. They believe that the complaint may be cured by "passing it on" to a hitherto innocent person—another potent cause of the seduction of boys and girls, as well as for the even more reprehensible outrages against children of which we sometimes read.

I wish it had been possible for me to write less plainly—to observe the tapu more carefully. I doubt not many will think my language has been too plain. Yet ever have I endeavoured to restrain the vehemence of my words, lest others, who have

not beheld the horrors I have seen, should think me guilty of extravagance or of mere violent abuse. I am really *very* sure that disease does not diminish immorality. But with my own eyes I have seen many guiltless children perish of it, and I know that thousands—nay, tens of thousands, have perished thus. Every year I know of men, wicked if you will, or weak if you will, in their youths, but afterwards the stay and prop of prosperous homes, who perish thus—of aneurism, of apoplexy, of paralysis, of insanity—or who live on blind and useless. Not once nor twice only have I seen an unfortunate and wholly innocent woman, happy till then in the knowledge of her own beauty, become monstrous, a horror, and an offence against the sun. Not once nor twice only have I seen such an innocent one bear a succession of dead or dying children, or children that were better dead than alive. I think of all this useless and preventable misery, I hear "social reformers" palter with the question as to whether "sin" is worse than the disease, or disease worse than sin, and my gorge rises. It is then not easy to pick and choose my language. It is beyond my comprehension that "social reformers" cannot perceive that disease does not prevent immorality, but rather conduces to it; and that even if it did, the end would not justify the means; that they do not perceive that if another man

sins, the sin is that other's; but that if they cause the death of a little one, by checking the hand that is stretched to save, the crime is their very own. On their heads, then, rests the innocent blood; from their hands should be asked an awful account.

The reader is perhaps wondering how all the foregoing bears on the proper theme of this work—Temperance Reform. The answer is easy. Only the great procreation fetish, on which I have dwelt so long, hinders national temperance legislation. Under threat of social and material ruin condemnation of the fetish is tapu. But all men think largely of it, and most thinking men condemn it, and it is to thinking men I have appealed in my attempt to demonstrate the manifold evils which flow from a conspiracy of silence. The same men or class of men who railed against Malthus, who opposed the introduction of chloroform, who decree the death in torture of the parturient mother, who call for human sacrifice on a vast scale through the medium of venereal disease, the same men, the same fanaticism, the same degraded fetish worship I say, render rational temperance legislation impossible for the time being. But for the time being only. To-morrow may see, I think is sure to see, the dawn of a brighter day.

Through tears and suffering; through disease and untimely death; through all the miseries caused by intemperance, our race has won its way. At length, by virtue of a grief-laden past, it has become capable of enduring the hard conditions imposed by modern civilisation. It has spread over the fairest portion of the globe. The future calls it to a destiny of unexampled splendour. Safe as a race from war and famine, and even from disease and alcohol, it has builded its empire on the solid rock. We know of no combination of forces which is likely to prevail against it. But must the tears and suffering be perpetuated for ever in equal measure? Must the future of the race be as grief-laden as the dreadful past? Something we can do if we set our shoulders to the wheel. Death we may delay, but we cannot in the end prevent. Disease will be with us always, but over certain forms of it our power is growing very great. Over intemperance, perhaps the chiefest source of human misery, science gives us a power almost absolute—if only we have the courage and the self-sacrifice to use it. Our fathers wrought in the cause of sobriety, but wrought in vain. They knew not the secret of Nature and fought against her. Unmindful of the race, thinking only of the individual, forgetful of the future, labouring only for the present, they sought not only to save the drunkard,

but to make him the progenitor of a happy posterity. Their task was impossible.

> "Nature red in tooth and claw,
> With ravine shrieked against his creed."

But our time has seen the labours of Darwin. We know now the great secret. Science has given us knowledge and with it power. We have learnt that if we labour for the individual alone, we shall surely fail; but that if we make our sacrifice greater, if we labour for the race as well, we must succeed. Let us then by all means seek to save the individual drunkard; with all our power let us endeavour to make and keep him sober; but let us strive also to eradicate the type; for as I have said, if we do it not quickly and with mercy, Nature will do it slowly and with infinite cruelty.

APPENDICES

APPENDIX A

THE DRINKING CUSTOMS OF THE ANCIENT EGYPTIANS

CONTRIBUTED BY DR A F. R. PLATT, M.B.

1. *Wine and beer are known to have been used by the Ancient Egyptians from earliest times.*

The oldest known tombs (in the *historic* period) constantly refer to wine and beer amongst the offerings to the dead (IV. Dynasty, B.C. 3998-3969). Recent discoveries during the past five years or so have brought to light tombs of kings of the first three Dynasties. Curiously enough some of the things found therein are the clay sealings (with the king's name) on wine jars.[1] (See Petrie's "History of Egypt," vol. i. 4th edition, 1899, p. 17 *et seq.*). This carries back the use of wine to B.C. 5000 at least.

2. *Drinking was carried to excess.*

"Further on a beer-house stands . . . . . The Egyptian is sober as a rule, but when he allows himself a 'good day' he never deprives himself of the pleasure of drinking, and has no objection to intoxication. The beer-house openly frequented by some, secretly by others, always has an excellent trade . . . the habitual customers sit side by side fraternally drinking beer, wine, palm brandy (shodou) . . . the wine is preserved in large amphoræ, pitched outside, and closed with a wooden or clay stopper, over which some mud is laid, painted blue, and then stamped with the name of the owner or reigning Pharaoh. An inscription in ink, traced upon the jar, indicates the origin and exact date of the

[1] The vine, the wine-press, jars of wine adorned with garlands, slaves handing the wine round at feasts, are all found in the wall-paintings of tombs of various periods.

wine. . . . Beer has always been the favourite beverage of the people. . . . The beer-houses contain stores of as many varieties of beer as of different qualities of wine. If you enter you are scarcely seated before a slave or a maid-servant hastens forward and accosts you: 'Drink unto rapture, let it be a good day, listen to the conversation of thy companions, and enjoy thyself.' Every moment the invitation is renewed: 'Drink, do not turn away, for I will not leave thee until thou hast drunk.' The formula changes, but the refrain is always the same—*drink*, *drink*, and again *drink*. The regular customers do not hesitate to reply to these invitations by jokes. . . . 'Come, now, bring me eighteen cups with thine own hand. I will drink till I am happy, and the mat under me is a good straw bed upon which I can sleep myself sober.'[1] They discuss together the different effects produced by wine and beer. The wine enlivens and produces benevolence and tenderness; beer makes men dull, stupefies them, and renders them liable to fall into brutal rages. A man tipsy from wine falls on his face, but any one intoxicated by beer falls and lies on his back" ("Life in Ancient Egypt and Assyria," p. 28 *et seq.*, by G. Maspero, late Director of Archæology in Egypt, etc. Translated by Alice Morton. Chapman & Hall, 1892).

". . . . . the Festival of the Dead. On the night of the 37th of Thoth, the priests kindled before the statues in the sanctuaries and sepulchral chapels the fire for the use of the gods . . . . . almost at the same moment the whole country was lit up from one end to the other; there was scarcely a family who did not spend the night in feasting. . . . . 'The gods of heaven exclaim "Ah! Ah!" in satisfaction, the inhabitants of the earth are full of gladness . . . . . all those who are gathered together *in the town are drunk with wine* . .' (Dümichen, Dendera pl. xxxviii. 11, 15, 19). The people of Dendera crudely enough called this the '*Feast of Drunkenness.*' From what we know of the earlier epochs, we are justified in making this description a general one, and in applying it, as I have done here, to all the

[1] The remarks of the drinkers are taken from a scene of a funeral meal in the tomb of Ranni, at El-Kab.

festivals of other towns than Dendera" (Maspero: "Dawn of Civilisation," pp. 321-2. English translation).

"The Egyptians hold public festivals not only once in a year, but several times; that which is best and most rigidly observed is in the city of Bubastis, in honour of Diana. . . . . When they arrive at Bubastis they celebrate the feast, offering up great sacrifices, *and more wine is consumed at this festival than in all the rest of the year*" (Herodotus, ii., 59-60).

Herodotus visited Egypt, B.C. 454.

"At their convivial banquets, among the *wealthy classes*, when they have finished supper, a man carries round in a coffin the image of a dead body carved in wood . . . . . and showing this to each of the company, he says, 'Look upon this, then drink and enjoy yourself, for when dead you will be like this.' This practice they have at their drinking parties" (Herodotus, ii. 78).

In the story of the clever thief and King Rhampsinitus Herodotus says: "And the sentinels, having taken very copious draughts, became exceedingly drunk, and being overpowered by the wine, fell asleep on the spot where they had been drinking" (Herodotus, ii. 121, 4).

In offerings to the Egyptian deities wine frequently occurs and several different kinds are noticed in the sacred sculptures. According to Plutarch at Heliopolis wine was forbidden to be taken into the temple, and the priests of the God worshipped in that city were required to abstain from it. "Those of other deities," he says, "were less scrupulous," but still they used wine very sparingly, and the quantity allowed them for their daily consumption was regulated by law; nor could they indulge in it at all times, and the use of it was strictly prohibited during the more solemn purifications, and in the times of abstinence.

Plutarch is a late authority, of course, and like many classical authors, not absolutely reliable in Egyptian matters.

In Sir J. Gardner Wilkinson's "Popular Account of the Ancient Egyptians" is figured, page 52, vol. i., women at a feast drunk and vomiting, and as these are copied from Theban tombs, their date is probably that of the XVIII. to XX. Dynasties (B.C. 1587-1000).

3. *Was abstinence commanded?* No! temperance was. "The moralists reprove these excesses, and cannot find words strong enough to express the danger of them. Wine first loosens the tongue of man, even wresting from him dangerous words, and afterwards it prostrates him, so that he is no longer capable of defending his own interests. Do not, therefore, forget thyself in the breweries; be afraid that words may come back to thee that thou hast uttered, without knowing that thou hast spoken. When at last thou fallest, thy limbs failing thee, no one will help thee, thy boon companions will leave thee, saying, 'Beware of him, he is a drunkard.' Then when thou art wanted for business, thou art found prone upon the earth like a little child" (The Maxims of Ani. XVIII. Dynasty, about 1530-1330).

"Young men especially should avoid this shameful vice, for beer destroys their souls. 'He that abandons himself to drink is like an oar broken from its fastening, which no longer obeys on either side; he is like a chapel without its god, like a house without bread, in which the wall is wavering and the beam shaking. The people he meets in the street turn away from him, for he throws mud, and hoots after them until the police interfere and carry him away to regain his senses in prison'" (Maspero: "Life in Ancient Egypt," translated by A. Morton, p. 31).

The "Maxims of Ptah-hetep" contained in the "Prisse Papyrus" is the oldest collection of precepts known. It dates from the time of Assa, a king of the V. Dynasty. Although the actual copy we possess (Bibliothèque Nationale, Paris) is probably of the XII. Dynasty, it appears to have been copied from a more cursive original (Soc. Bib. Arch., XIII. 65) which might be of the date of the actual composition, and there seems to be no reason to question the statement that Ptah-hetep, in the reign of Assa, wrote this work (Petrie: "History of Egypt," vol. i. 81). In this Papyrus sobriety is eulogised.

4. *Were all classes drunken in Ancient Egypt?* From the above it is almost certain that *all* classes were given to occasional intoxication, although I cannot give a reference which states so definitely.

APPENDIX B

"ORGANISED beings present, as you are aware, two main kinds of reproduction, the sexual and the asexual. These two kinds of reproduction present certain differences, of which the most important, and the only one which concerns us now, is the fact that genetic variation is essentially associated with sexual reproduction, and is rarely, if ever, found in asexual reproduction. In other words, whereas the offspring resulting from asexual reproduction as a rule exactly resemble the parent, they are always different from the parent in sexual reproduction. . . Speaking broadly, genetic variation is connected with sexual reproduction" (Professor Adam Sedgwick's Presidential Address, Section D., British Association, 1899).

APPENDIX C

THE human body, like that of all the higher plants and animals, is a cell community. The cells are mostly adherent, and all have descended from a common ancestor, the fertilised ovum; but in a very real sense every cell is a distinct and separate living entity, a unicellular animal. Blood-cells are free, germ-cells are purely parasitic, skin-cells have often been transplanted; there is little doubt that had we the requisite skill it would be possible to transplant every other kind of cell. No single cell in the body is the offspring of any other co-existing cell or group of cells; but every cell is derived from a pre-existing cell. *Omnis cellula e cellula.* The whole cell-community is separable into two distinct, but very unequal parts; into germ-cells, and systemic (somatic) cells. To the former belong the function of continuing the race, to the latter the function of protecting the all-important germ-cells.

A few years ago it was universally believed that acquired characters were transmissible. It was thought that changes in body and mind—caused by exercise, disease, accident, or what not—affected the germ-cells in such a special manner, that the traits the parent acquired tended to reappear as inborn characters in the child. At the present day the majority of those who have given real scientific attention to the question believe the contrary. The problem is of obvious importance to medical men, who, however, as a body have curiously neglected it. Before beginning its discussion it is necessary to define a couple of terms, the loose use of which has resulted in endless confusion.

An inborn character may be defined as one which results in the individual from the constitution of the germ-cell (or pair of

germ-cells) whence he sprang. Thus a man's ears, eyes, nose, etc., are inborn characters. They arise because his germ is so constituted that under fit conditions of shelter, nutrition, etc., it tends to proliferate into an organism having those characters. An acquired character, on the other hand, is one which results from the action of the environment on the soma—the systemic or body cells—as distinguished from the germs. Hence all characters produced in the individual by modes of life, by exercise, disease, or accident, are acquirements. To take an example: Suppose the child of a normal man is blind, then the blindness is inborn if due to a defect in the germ whence the child sprang, but acquired if due to disease or accident to the visual structures *after* they have developed from the germ. The error is often made of supposing that all new characters are acquirements. Thus a supernumerary digit on its first appearance in a family is often spoken of as one. It must, however, be clearly borne in mind that the distinction between the inborn and the acquired is not one between the old and the new; it is wholly one of origin. Inborn characters originate in the germ-cell; acquired characters in its descendants, the somatic cells. As a fact, every character acquired or inborn is new to every individual who has it; thus a man's head is as much a novelty to him personally as a supernumerary digit. Every child differs somewhat from its parent. When a difference is inborn (*i.e.* when it is due to a germinal peculiarity), it is technically termed a "variation." All acquirements, on the other hand, are termed "modifications." It should be noted that a modification (unlike a variation) does not necessarily imply a difference from the parent; both parent and child may acquire similar modifications. Again, it should be noted that an acquirement, if transmitted, would produce in the offspring, not another acquirement—*i.e.* modification—but an inborn trait—*i.e.* variation—since the latter would be due to a change in the germ-plasm. The only case in which the acquirement could be transmitted as an acquirement would be when a modification in a *mother* so affected her *foetus*, that a similar modification arose in it. In that case the modification, if again

transmitted, would appear as a variation in the third generation. Obviously, male parents can transmit modifications only as variations.

The cause of variations is in dispute. Many elaborate theories have been enunciated, which, at the least, afford splendid testimony to the imaginations of their authors. We need not dwell on them; suffice it to say that variations do occur, no matter how produced. Men do differ in inborn characters from their parents. Now the body, as I say, is a cell-community, composed of germs and other cells. Suppose, then, a man acquires a character; suppose, for instance, he strengthens his arms by exercise, or weakens his legs by laziness, in that case, if his acquired character is to be transmitted, the change in his arms or legs must *so* affect his germs, that it will be reproduced (as an inborn character) in the children into which the germs proliferate. This consideration at once reveals the difficulty of the belief in the transmission of acquired characters. How can each one of the million changes which may occur in the arms, legs, and other parts of the body affect the germs (situated, it may be, far distant) in such a *special* manner that, after fertilisation and long separation from the parent organism, the germs will proliferate into beings that have inborn the *particular* character the parent acquired? How, for example, can a modification of the parent's great toe affect his germ differently from a modification in his little finger? What is the machinery by which this magical process is carried out? It must be remembered that a child is not derived from the whole of his parent's body. He develops out of a very minute portion of it only—the germ-cell. His eyes are not the offspring of his parent's eyes; his legs have not origin in his parent's legs; his brain is not descended from his parent's brain; but every portion is derived solely from the germ-cell, which, so far as we know, is indebted to the body-cells for shelter and nutrition only. Again, it must be remembered, that in the germ there are no tissues similar to those in the parent—no muscle, bone, or nerve-cells, for instance. It is in vain to argue that the potentiality of them is present; the fact remains that they are not present.

They only arise much later in the very remote cell-descendants of the germ.

Yet, again, it must be remembered that it is not asserted by any one that acquired modifications never influence the germs. It is only asserted that there is absolutely no evidence that changes in the soma influence germ-cells in such a particular and unlikely direction that the modifications of the parent are transmuted through heredity into similar variations in the child. For instance, it is not asserted that changes in the brain may not influence the germ in any one of a million or a billion possible directions; it is only asserted that they do not—except perhaps as a coincidence so rare that no instance of it has been found—influence the germ in the particular direction which is meant when the transmission of an acquired character is maintained.

Lastly, it must be remembered that, when some external agency finds entrance into the body and acts directly on the germ, it is not asserted by any one that the germ is incapable of being modified by it. Thus, it is not asserted that alcohol or the toxins of disease, when present in the parent's blood, do not influence the germ. It is possible that they do. It is only asserted that external agencies do not—except, again, as a coincidence so rare that no instance is known—so influence the germs that the offspring arising from them have inborn the modifications which the agency caused in the parent. For instance, experience in some diseases gives rise in a man to acquired immunity, *i.e.* a great increase of resisting power; but it is denied that his germs are so affected by the toxins in his blood that his children, as a consequence, develop a resisting power greater than they would otherwise have had. It would be very extraordinary if they did. Such a variation in the child would imply a very delicate and peculiar alteration of the germ, and there is no reason known why that particular alteration should arise, rather than any one of a million other possible alterations—say, a diminished liver or an enlarged toe, or a taste for blue china or for chocolate. It will be observed

that this last question, strictly speaking, is not a problem of heredity at all. Nothing is supposed to be transmitted from the parent to the child. On the contrary, an external agency is supposed to affect both the parent organism and its germs, the latter in a highly particular way. It is obviously necessary, however, to discuss it, for if the germ were so affected, then, since variations are transmissible, the consequent variation would tend to be transmitted to future generations. It should be added that though it is not denied that modifications of the parent, or external agencies, circulating in the blood, may so alter the germs that the offspring arising from them are also altered in this or that *other* way, yet no instance of such an alteration has been traced, at any rate, in the higher animals. The complexity of the high animal body, the multitude of its characters, renders such tracing of cause and effect impossible.

The modern denial of the transmission of acquirements is really founded on, or should be founded on, the cell theory. Before its enunciation the different parts of the offspring were supposed to be derived from similar parts of the parent. Man, for example, was regarded as an individual. We know now that, from the standpoint of heredity, he is a community—a community of specialised cells, of which one set, the germs, are specialised for the production of similar cell-communities, just as other sets are specialised for the production of motion or of bile. We have therefore no more reason to suppose that muscle or liver cells play parts in heredity than to suppose that germ-cells play a part in movement or in the production of bile. Formerly, when the transmission of acquirements was believed without question, some remarkable hypotheses to account for the supposed transmission were formulated, occasionally by very distinguished men. Darwin's theory of pangenesis and Spencer's theory of physiological units are examples. These speculations were what are known as "working hypotheses"—hypotheses, that is, in which the amount of theory (perhaps I should say guess-work) is wholly disproportionate to the foundation of fact,

and which a more extended acquaintance with the facts usually reveals to be misleading. At the present day, when the transmission of acquirements is generally disbelieved, some working hypotheses, as remarkable, but running to the other extreme, have been formulated. Under very high powers of the microscope the nuclear matter of the fertilised germ may be seen to divide, apparently with great accuracy. On this slender foundation Weismann has built his hypothesis of the continuity of the germ-plasm, adding amazing complications in the way of ids and idants and biophors, hypothetical bearers of heredity. Cheerfully entering into the regions of the unknown and probably unknowable, he has attempted to explain how inborn characters are transmitted. Biologists in larger part have followed him.

His speculations, darkening counsel, crop up in every discussion of the subject. As a fact, they have no essential bearing on it. The doctrine, first formulated by Galton, that acquired characters are not transmissible, is one thing, and is supported by abundant evidence. An attempt, on obscure intracellular grounds, to explain *how* inborn characters are transmissible, even if it involves the corollary that acquired traits are not heritable, is quite another thing. If successful, it would afford additional proof of the former doctrine; its failure does not involve disproof of it. Galton's theory rests on the plain facts that each individual is derived solely from a single cell, the germ, and that there is no evidence that the somatic cells influence the germs in such a *special* and unlikely manner as to cause the particular characters the parent acquired to be reproduced by the children. It does not rest on more or less metaphysical speculations concerning the continuity of the germ-plasm, or of ids, idants, or biophors, and so forth. It is deeply to be regretted that this red herring of Weismannism has been drawn across the trail. Weismann may or may not be right. There is not a particle of evidence one way or the other. No one has seen the germ-plasm; at any rate, no one can recognise it, much less an id or an idant. The whole hypothesis is a

groping in the dark; a guessing about things concerning which there are no data; a metaphysical speculation in regions unknown; not a scientific deduction from known fact. His speculations, obscure in themselves, made more obscure by his methods of demonstration, still more obscure by constantly being amended under the influence of destructive criticism, have drawn many students from the true path, and by their difficulty have discouraged others.

The actual issues involved are very simple. Either the germ-cells are influenced by the other cells in particular directions—in millions of particular directions—or they are not. Not a tittle of evidence has been adduced to prove that they are. In other words, no single instance of the transmission of an acquired character has been recorded. It is true that some medical men maintain that the children of old men who have suffered from gout have a greater tendency to that disease than the children of younger men; but this is just one of those wild, unconfirmed guesses with which medical literature unfortunately abounds. No statistical proof has been advanced. *Post hoc* has been confused with *propter hoc*. Men with a gouty diathesis, an inborn trait, tend, under fit conditions, to develop gout; inborn characters are transmissible; children are usually placed under much the same conditions as their parents, therefore gouty men often have gouty children. There is nothing to prove that the parental acquirement, the disease as distinguished from the diathesis, in any way affects the offspring. The poor Irish peasantry do not suffer from gout. When they have the diathesis it remains latent. Removed to richer food and easier conditions in English cities, they suffer, on the average, as much as other people. There is nothing, in fact, but guess-work, mere opinions unsubstantiated by close and accurate observation, to show that the younger children of a gouty family are more liable to gout than the elder. Mutilations are sometimes instanced by medical men as affording examples of the transmission of acquirements. Seeing, as they daily do, injuries caused by accident, disease, and the surgeon's knife, medical men should be peculiarly qualified to judge. In a million instances,

there is no apparent transmission. In the millionth and one a man with an amputated leg has, perhaps, a son with a deformed toe; thereupon, the transmission of an acquirement is triumphantly proclaimed. There is, however, such a thing as mere coincidence. It is forgotten that though every mother loses her hymen and nearly every terrier his tail, yet congenital absence of hymen and tail is still so rare as to be regarded with extreme suspicion. Maternal impressions are much relied on. A mother sees a mutilated or malformed man, and it happens that her child is malformed. Here again the element of coincidence is forgotten. Every woman sees malformations during her pregnancy, but very few have malformed children. The children of nurses and lady doctors are not peculiarly liable to malformations. Moreover, the mother gets a mental impression; the child, something quite different, a physical malformation; therefore, in any case, there is no transmission of the mother's acquirement. Often, as in the case of gout, diathesis is confused with disease. Thus, father and son may both have an inborn (and transmissible) incapacity to resist the bacillus of tuberculosis. They both get infected. Thereupon, the son is supposed to have inherited consumption from the father. He merely inherits the incapacity to resist the bacillus. The acquirements, infection and disease, come later. Like the parent, he acquires them for himself. Again, certain morbid conditions depending generally on structure are inborn, *e.g.* hæmophilia. The father, perhaps the first of his race to be so afflicted, transmits his inborn peculiarity, like other inborn traits, to the child. The new is then confused with the acquired, and the transmission of an acquirement thought to be proved.

APPENDIX D

CHARACTERS, CONGENITAL AND ACQUIRED

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The characters of a living organism, plant or animal, are usually grouped by biologists under two heads, the congenital or the inborn, and the acquired. But, hitherto, no systematic attempt has been made to give precision to these terms—to define precisely what we mean by them, and, in the case of any particular organism, to ascertain exactly which of its characters are inborn and which are acquired. I know nothing in the whole range of science which promises to the thinker more immediate and solid results than this strangely neglected field of investigation. For example, had it received the attention it deserved, it is probable that the great controversy as to the transmissibility of acquired traits between the Neo-Lamarckian and Darwinian schools would long ago have ceased, since only after it has been definitely determined whether this or that trait is inborn or acquired can the fact of its transmissibility or non-transmissibility be used as an argument for or against the Lamarckian doctrine. This precisely the disputants have not done — an assertion I shall justify presently. To deal with my subject adequately, one should have the powers of a Darwin or a Herbert Spencer; if, however, I can contrive to direct attention to it, I shall be well content.

An inborn variation may be defined as one which arises in an organism owing to changes previously produced by the action of the environment on the germ-cell (or pair of germ-cells), whence it sprang. As inborn variations are admittedly transmissible, all inborn characters must have arisen thus in the ancestry, and

deductively, it must follow, as, indeed, may easily be proved inductively, that changes in a germ-cell tend to be reproduced in its descendant germ-cells, for which reason the organisms which arise from them tend also to reproduce the inborn variations of the parent organism.

An acquired character may be defined as one which arises in the organism owing to changes produced by the action of the environment, not on the germ-cell, but on the somatic cells derived from it. If acquired modifications are transmissible, then changes in the somatic cells must tend so to modify the germ-cells associated with them that, as a consequence, the organisms they proliferate into tend to reproduce, as inborn characters, the *particular* modifications which were acquired by the parent organism.

I daresay that the above definitions may be objected to by some of my readers, but I have hopes that, on consideration of what follows, the majority will assent to them as indicating pretty correctly what we really mean by the terms "inborn" and "acquired." I do not here propose to discuss the question as to whether acquired modifications are transmissible; I have done it at length elsewhere, and my present object is rather to differentiate accurately between the acquired and the congenital, and to ascertain the parts played by them respectively in the organic world. I may, in passing, however, notice one or two points which have been frequent sources of confusion, and the consideration of which may help to bring the meaning I intend my definitions to bear clearly before the mind.

It has often been maintained by Neo-Lamarckians that important modifications in the soma (*e.g.* the effects of disease) *must* affect the associated germ-cells, and that, therefore, acquired modifications *must*, to some extent, be transmissible. They miss the point at issue. It is not denied that changes in the germ's environment (*i.e.* in the body of the parent) may result in modifications in the organism into which the germ subsequently proliferates, but it is strenuously denied that acquired modifications in the parent tend specially so to modify the germ as to

cause the organism into which it subsequently proliferates to reproduce congenitally the *particular* modification which the parent acquired. Again, supposing some cause (*e.g.* some disease) produced a modification (*e.g.* cavities in the lungs) in the soma, and that, subsequently, in the absence of the cause, the offspring developed the modification; even this would not constitute an absolute proof of the Lamarckian doctrine, though it would raise a presumption in favour of it. For it must be remembered that it is not asserted that a force acting on an organism cannot produce such a change in the germ as will cause the organism into which it develops to exhibit a variation similar to the modification produced by the force in the parent; but that it is asserted that this coincidence, this mere coincidence, must, from the nature of the case, be extremely rare, so very rare that, as factors in evolution, such apparent, but only apparent, transmission of acquired traits may practically be ignored. Only after it had been shown that clear and indubitable cases of reproduction by the offspring of the parents' modification are not uncommon in nature could the truth of the Lamarckian doctrine be accepted as proven.

Watching the multiplication of an infusorian (*Stylonychia Pustulata*), Maupas observed that, after two of these had conjugated, the resulting fertilised cell divided and re-divided many times without conjugation again occurring, but that if, after a pretty certain definite number of cell-divisions, conjugation did not again occur, the race ultimately died out. He found, moreover, that the descendants of a conjugated pair did not conjugate among themselves, but only with the descendants of another conjugated pair. All this is the rule among higher plants and animals. The ovum and the sperm are unicellular organisms. After conjugation they divide and re-divide many times without conjugation again occurring among the descendant cells. But these, like infusorians, if they do not conjugate, ultimately die out. Most of them (*i.e.* the somatic cells) are incapable of conjugation, while such of them as are capable of conjugation (*i.e.* the germ cells) conjugate only with cells from another body (*i.e.* cell-family). There

are, as is well-known, exceptions to the above; unending reproductions may occur without conjugation, as among such plants as are propagated by slips or suckers, and self-fertilisation also occurs, but the general rule is as I have stated. A multicellular plant or animal in the successive *stages* of its development is, therefore, the homologue, not of the remote ancestral unicellular organism, but of all those successive *generations* of unicellular organisms which intervene between one act of conjugation and the next.

Unlike the cell descendants of a conjugated unicellular organism, the cell descendants of a conjugated germ differ from it, and from one another, in that they undergo differentiation along certain definite lines (into nerve, muscle, bone, etc.), the germ-cells being so specialised that the cell-communities which spring from them are very like the cell-community of which they were cell-members; for which reason a man, for instance, is like his parent. Moreover, the cell-descendants of a conjugated germ differ from the cell-descendants of a conjugated unicellular organism in that they remain adherent, and in that, in different lines of descent, they multiply at different though definite rates. Did the cell-descendants of the germ all multiply at an equal rate, a solid spherical mass of cells would, of course, result; whereas, owing to differences in their rates of multiplication, the shape of multicellular plants and animals are irregular (*i.e.* not spherical). But, though these rates of multiplication in different lines of descent are pretty definite in every species of plant and animal, they differ widely in different species, whence arise differences in shape betwixt one species and another. An ox, for instance, differs in shape from a man because in it the cells, in different lines of descent, do not multiply at the same rate as in the man.

We cannot doubt that, when first multicellular organisms were evolved from unicellular, all the cells constituting the mass were morphologically and physiologically similar, and that, therefore, like the ancestral unicellular organism, every cell was capable of performing all the functions of life—food-getting, locomotion, reproduction of race, etc. Later, as a result of Natural Selection, differentiation appeared among the adherent cells of the community,

some taking on one function and some another, till at length a high degree of differentiation resulted, and the reproduction of the race was delegated to the germ-cells.

As I have already indicated, among unicellular organisms every cell is a germ-cell, and as such is capable of continuing the race. Among low unicellular organisms this power persists in many cells, and the environment decides whether it shall be exercised or not; thus, if almost any fragment of a sponge be bedded out, it will proliferate into a complete individual. It persists longer in plants than in animals; thus from a fragment of begonia leaf may arise an entire individual capable of continuing the race, the cells being turned from their original destiny by a change in the environment. But among higher plants this power of reproducing the entire individual by means of cells other than germ-cells, or what may normally proliferate into germ-cells, is very exceptional. All that commonly persists is the power of reproducing from such fragments of the complete organism as contain cells, which might normally proliferate into germ-cells, the parts wanting to render the fragments a complete organism. Thus a geranium slip, for instance, contains cells which normally (*i.e.* when the branch remains part of the plant) proliferate into germ-cells. If this branch be bedded out as a slip, it produces the roots which are needed to convert it into a complete organism of its species. Here germ-cells are not produced from cells not destined to that purpose as in the begonia leaf, but lost parts are reproduced by what may be termed, and in fact is, an exaggerated process of healing. In other plants the power of reproducing lost parts is present in a much smaller scale, and only comparatively trifling injuries are healed; *i.e.* a small fragment cannot reproduce the whole, though the whole can reproduce lost fragments. Among animals, owing to the greater specialisation of the cells, and the more complex condition under which they live, this power of reproducing lost parts is present in general to a much less extent than among plants. Low in the scale, as we see, a fragment of sponge, for instance, can reproduce the whole. Higher in the scale, a star-fish can reproduce a ray, a lobster a

claw, a lizard its tail, and so forth, but none of these parts can reproduce the whole; that is done solely by germ-cells. Higher yet, as among birds and mammals, the power of reproducing lost parts is comparatively very trifling; important and complex parts cannot be restored. Wounds and mutilations are healed, but, if serious, very imperfectly, for only scar tissues replace the tissues which were lost.

We see, then, that the reproduction of lost parts, whether it be on a very great and perfect scale, as when a fragment reproduces a whole, as in a sponge, or whether it be on a very small and imperfect scale, as when a wound is healed in one of the higher animals, is a process of the same order. Now, we speak of a scar in a man, for example, as an acquired character; but who would dream of speaking of all that which is reproduced by the fragment of a sponge or a begonia leaf as a character acquired by the fragment. Moreover, when one of the higher animals is mutilated, as when a dog loses his tail, we lump together both the mutilation and the tissue with which the lost part is replaced (*i.e.* the scar) as a single acquired character. But, even if we should agree for convenience to regard the scar as an acquired character, surely the mutilation ought not to be so designated, but should rather be termed (as I venture to suggest) an *enforced* character. We see, moreover, that the power of reproducing lost parts to a greater or less extent persists throughout organic nature, but that this power is vastly greater lower in the scale than higher. In other words, if we agree to regard such reproductions as acquired, observation proves that the power of acquiring them is very much greater lower in the scale (*e.g.* sponge), than it is higher (*e.g.* man).

On the other hand, there is another class of acquired characters — *perhaps the only class to which the term should be applied properly* — the power of acquiring which is greatest among the highest animals, and, apparently, is little or not at all present among the lower animals, nor in the whole of the plant world. I speak of such characters as arise as a result of exercise and use, as, for instance, the increased muscular power of an

athlete. In the plant world characters cannot, of course, be acquired to any extent as a response to the stimulation of exercise and use. Plants, therefore, of necessity, attain their full development in the absence of almost all stimulation other than such as are supplied by food and warmth. Of such plant-like animals as sponges, the same also, of necessity, is true. It is true, with possible exceptions, even of such active animals as insects. Thus, a pupa may develop into a perfect insect while lying quiescent. The lower vertebrates, such as fish and reptiles, have also little or no power of developing in response to the stimulation of use and exercise; apparently they are able to grow into normal adult animals in its absence; thus, if a tadpole finds its way through a crevice into a small cavity, and is able to obtain sufficient food, it develops into a normal frog, though it leads a purely vegetative life. Higher yet in the scale among birds and mammals, and most of all amongst the highest mammals, the animal attains its full development, as regards many structures, only in response to the stimulation of exercise and use; thus, for instance, if the limb of an infant be locked by paralysis or by a joint disease, so that it cannot be used, it does not develop into an adult limb. Now, if a "normal" man takes a more than ordinary amount of exercise, he gets a more than ordinary development of various structures, as happens in the case of the blacksmith's arm. This extra development is regarded by biologists as "abnormal" and is rightly termed "acquired." But, as we see, the "normal" degree of development is attained only as a response to exercise (*i.e.* stimulation), similar in kind though less in amount. *Therefore, it is clear that the full development of the normal adult arm, as well as many other important structures, is acquired*, differing in this from eyes, ears, teeth, nails, etc., which are wholly inborn, and do not owe their development in the least to use and exercise. In fact, on consideration, I think it will be found that adult man differs physically from the infant almost wholly in characters which are acquired, not in those which are inborn. In teeth, hair, skull-bones, genital organs, and in some other respects, he differs from the

infant as regards inborn characters; but as regards almost all the structures of the trunk and limbs, and most of those of the head, the difference is in characters which have been acquired by the adult in response to the stimulation of exercise and use. Thus, the limbs develop wholly in response to use, the heart and arteries develop within certain limits in proportion to the strain put on them, as also do the lungs and their accessory muscles, as well as the bony attachments of the latter. The muscles, arteries, nerves, etc., of the head and neck also develop in response to the same stimulation. Moreover, the normal standard of development is maintained only as a response to this stimulation (*i.e.* use, exercise), for example, when not used, the muscles, with their co-ordinated structures, atrophy and tend to disappear, as in the case of a paralysed limb. It may be added that it is probable that even the infantile standard of development is, to some extent, acquired under the stimulus of fœtal movements *in utero*.

In upholding the doctrine of the transmissibility of acquired modifications, much stress has been laid by Mr Herbert Spencer and others on the exquisite co-ordination of the multitudinous parts of the high animal organism. They maintain that this co-ordination affords decisive proof of the Lamarckian theory, the line of argument being as follows: It is not probable that the many structures of a high animal can ever have varied favourably together (as compared to the parent) in any individual animal. It is unbelievable that they can all have varied favourably generation after generation in a line of individuals. A chain is only as strong as its weakest link. A favourable variation, say, a larger horn in the elk, if unaccompanied by corresponding variations in all the thousand parts (in head, neck, trunk, limbs) co-ordinated with it, would be useless, and even burdensome. In other words, if a single structure (muscle, bone, ligament, etc.) of all those associated with the larger horn failed to bear the strain of it, the larger horn would not favour survival, but, on the contrary, would be a cause of elimination. Therefore, say these thinkers, the evolution of high multicellular animals cannot be

attributed to the accumulation, during generations, of inborn variations alone, but must, in part, be attributed to the accumulation, during generations, of the effects of use and disuse, *i.e.* to the accumulation of acquired modifications.

But modifications acquired as a result of use and disuse, are plainly never transmitted. Thus, an infant's limb never attains to the adult standard except in response to the same stimulation (exercise) as that which developed the parent's limb. The same is true of all the other structures which, in the parent, underwent development as a result of use, or subsequent retrogression in the absence of it. These, like the limbs, do not develop or retrogress in the infant, except as a result of similar causes. Plainly, then, what is transmitted to the infant is not the modification, but only the power of acquiring it under similar circumstances—a power which has undergone such an evolution in high animal organisms that, as I say, in man, for instance, all the developmental changes which occur between infancy and manhood are attributable to it. It follows, therefore, that the exquisite co-ordination of all the parts of a high animal is not due to the inherited effects of use and disuse, but to this great power of acquiring modifications along certain definite lines; so that if an animal varies in such a way as to have one of its structures (*e.g.* horn, which is wholly inborn) larger than the parent had, then all the other structures associated with it, owing to the increased strain (*i.e.* the increased stimulation) put on them, undergo a corresponding modification, and thus preserve the harmony of all the parts of the whole. So also, if the horn, for instance, be smaller than in the parent, the lesser strain placed by it on the associated structures causes these also to develop less than in the parent, whereby, again, the harmony of the whole is preserved.

I have dwelt at greater length on this neglected subject of acquired characters (properly so-called) elsewhere, but I think I have said enough even here to demonstrate its immense importance. The power of acquiring fit modifications in response to appropriate stimulation is that which especially

differentiates high animal organisms from low animal organisms. Without this power and the plasticity which results from it, the multitudinous parts of high animals could not well be co-ordinated, and, therefore, without it their evolution could scarcely have been possible. Indeed, it is not much to say, so vitally important is this power to the higher animals, that, as regards them, the chief aim (if I may use the expression) of Natural Selection has been to evolve it. But, since this power of developing in response to the stimulation of use operates mainly along certain definite lines, which are not quite the same in every species, the different species differ as regards size and shape, not only in characters which are inborn, but also in those which are acquired. Thus an ox differs in size and shape from a man not alone in inborn characters, but also in characters which are acquired as a result of exercise and use. The structures of both the ox and the man develop in response to appropriate stimulation, but not quite in the same direction, nor in the same proportion, nor to the same degree; hence, to some extent the differences in size and shape betwixt the two animals. Consider, for instance, the hind limbs of the ox and man: in both these grow greatly in response to the stimulation of exercise, but the lines of growth being somewhat different, the limbs do not approximate in shape and size. Presently, when we consider mind, we shall realise even more strikingly the importance of our subject, and perceive how deeply it concerns many fields of thought and investigation which have greatly interested mankind in all ages; but I have still something more to say as regards physical characters, though it is not possible in the space allotted to me to do full justice to the theme.

Acquired physical characters (properly so termed) may involve not only quantitive changes, which alone we have as yet considered, but qualitative changes also. Here, again, a wild field for investigation presents itself. For example, in man exercise does not merely cause a muscle to increase in size; it occasions besides, as in athletes after training, an increase in efficiency (*i.e.* in the power and duration of contraction) which is greatly

out of proportion to the increase in size. Intermittent friction or heat or other irritant (*e.g.* chemical) not merely causes the skin to thicken, as in corns and callosities; it renders it denser also. Again, stimulation (that is use) may result in change which is wholly qualitative. Thus eyes which, when unaccustomed to the task, are rendered sore by the continued scrutiny of small objects (*e.g.* print, as in the case of an adult learner) may by practice be trained, without apparent physical change, to endure this proceeding without damage. Most of these qualitative changes are best studied in connection with mind.

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I have said that the power of acquiring physical traits does not exist among lower animals, or, if it exists, does so in proportion as they are lowly placed in the scale of life, to an extent very small as compared to its development among high animals. If I am right as to this, low animals (*e.g.* invertebrates) should be incapable or little capable of acquiring immunity against zymotic disease. I am not aware, however, that any observations on the subject have been made.

It is possible that many who read the foregoing will be inclined to dispute the facts and inferences put forward, and to urge, for instance, that I have not established any proof, nor even brought forward convincing evidence, of the truth of my assertion that low animals are incapable, or less capable than high animals, of acquiring physical characters. There is, in truth, no literature to which I can appeal, for the question is entirely new; and therefore, also, so far as I am aware, no experiments directly bearing on it have been made. Moreover, in the highest animals all acquired physical characters are merely extensions of previously existing inborn characters. Thus the limb of an infant, which is compounded, as we may suppose, almost entirely of that which is inborn, grows under the influence of exercise and use into an adult limb. There is a sharp dividing line, but we cannot perceive it; and, therefore, as regards the infant's limb, we cannot yet say where the inborn ends and the acquired begins. But in mind, which we have next to consider,

the case is often very different. There the inborn is often sharply marked off from the acquired, and we shall find it emphatically true that low animals are infinitely less capable of acquiring mental traits than high animals. Whence, reasoning by analogy, we may, with some confidence, assert that if, as regards mind the statement is true, in the absence of evidence to the contrary, it is probably true also as regards the physical parts.

Mind, doubtless, owes its origin to movement—to the necessity for co-ordinated movement in the various parts of the complex cell-community which we call a multicellular animal. Neither mind nor nervous tissue, the organ of mind, exists in plants, among which there is little or no movement. So, also, low in the animal scale, as among sponges, in which cells are not co-ordinated to perform movements *en masse*, there is no mind nor any need for it. Higher in the scale, as among cœlenterates, in which masses of the cells combine to perform macroscopic movements, we begin to find traces of nerve tissue, but as yet there is, so far as we are aware, no mind. All movement apparently is purely reflex. Yet higher in the scale, as among the mollusca in which the increasing complexity of the environment necessitates increasingly complex co-ordinated movements of masses of the cell-community, the nervous mechanism by means of which this co-ordination is carried out becomes still more developed and complex, and mind apparently dawns. So far as we know, consciousness then first appears, and with consciousness the first rudiments of instinct.

I have elsewhere defined instinct as "the faculty which is concerned in the conscious adaptation of means to ends by virtue of inherited knowledge and ways of thinking and acting." In other words, instinct depends wholly on congenital characters, and not in the least on those which are acquired. This definition of instinct is far different from those which have hitherto found acceptance, but I think, on consideration, it will be found that it more correctly describes what we commonly mean by the term than any other hitherto put forth. By instinctive action do we not mean action which is independent of all previous experience

and therefore of acquirement? When an insect secures its proper food in the proper way, spins a cocoon, mates with an individual of the opposite sex, or lays its eggs, with fit provision for the future, in an appropriate place, does it not act solely by virtue of inborn inherited knowledge and ways of thinking and acting, and, since it is unguided by experience, not in the least by virtue of knowledge and ways of thinking and acting which are acquired? To the mind of every naturalist will at once occur innumerable instances of actions, some of them extremely elaborate and complex, performed by insects and other comparatively low animals, in which experience can play no part; in other words, which are wholly independent of acquired knowledge and ways of thinking and acting. By means of instincts animals are enabled to place themselves in harmony with an environment infinitely more complex than that to which reflex action alone can adapt them. The element of consciousness and its outcome, choice, are introduced. The conscious animal, unlike the unconscious, is enabled to choose between two or more courses, to which two or more instincts impel him. Thus the male spider approaches the gigantic female, guided by both the mating and life-preserving instincts, and all the complications of his subsequent conduct are due to his power of choice between two or more courses.

Higher in the scale, concurrently with the evolution of the power of acquiring physical traits (properly so called), is evolved the power of acquiring mental traits. It increases in successively higher animals, and at length, in the highest animals, becomes of such importance that it overshadows and replaces instinct, which, since it no longer holds a commanding place as a factor in survival, undergoes great retrogression. If I can make my readers grasp all that is implied in the above, I think they will admit the vast importance I have claimed for my subject—an importance which is vast not only from the standpoint of the man of science, but from many other standpoints, such as those of the moralist, the sociologist, the statesman, the philanthropist, the physician, and others as well. Let us contrast two animals

which, for convenience, we may regard as at opposite ends of the scale, the dragon-fly and man. Tennyson's beautiful lines occur to me. I quote from memory :—

> "To-day I saw the dragon-fly
> Come from the wells where he did lie.
> An inner impulse rent the veil
> Of his old husk. From head to tail
> Came out clear plates of sapphire mail.
> He dried his wings ; like gauze they grew.
> O'er crofts and pastures, wet with dew,
> A living flash of light he flew."

Physically, like other low animals, the dragon-fly does not develop in response to exercise and use, or, if he does, it is to a very small extent only compared to higher animals. Natural selection has nicely co-ordinated his structures, but has not evolved in them (at least to an appreciable extent) the power of developing further, and in the right direction, during the changing stress of circumstances. For example, his principal organs of locomotion, his wings and the structures which subserve them, are certainly wholly inborn. Mentally, at the beginning of each stage of his existence he is able to co-ordinate his muscles perfectly, and thus at the beginning of each stage his locomotion is apparently as good as at the end. Both in the water and in the air he knows what food to seek, and what enemies to avoid, and how to do so. At the fit time, impelled by an inborn impulse, he leaves the water, and, having undergone his last metamorphosis, is able at once to adapt himself to life in an entirely new environment, where the medium in which he exists, his mode of locomotion, his prey, and his enemies are different, and where his procreating instinct comes into activity. But experience teaches him little or nothing; he cannot acquire mental traits; in other words, *he has little or no memory.*

Far different is the case with man. We have seen how much he acquires physically, so that the adult differs from the infant mainly in traits which he acquires, not in those which are inborn. Mentally, his powers of acquirement are even more remarkable;

and, therefore, even more as regards his mental characters than as regards his physical characters, the adult differs from the infant in that which is acquired, not in that which is inborn. At birth the infant's mind is a blank; he can co-ordinate only a very few groups of muscles (*e.g.* the breathing, sucking, and defæcating groups), and in the co-ordination is never very delicate and elaborate. He knows nothing of his environment; he cannot, as can the dragon-fly, instinctively adapt himself to it. But gradually, as his body develops under the influence of use and exercise, his mind develops also under the influences of experience. and the blank left by the retrogression of instinct is filled, and more than filled, by acquired knowledge and ways of thinking and acting. Slowly and painfully the infant *learns* to co-ordinate his different groups of muscles till at length he can perform such complex acts as speaking, writing, and walking, in which the co-ordination is exceedingly delicate and elaborate. Much, very much, besides the power of co-ordinating his muscles is acquired by man. For instance, all the vast contents of his memory, and all that arises out of memory are, of course, acquired. Here, again, all that is inborn is *the power of acquiring the contents of the memory.* I have elsewhere defined reason as "the faculty which is concerned in the conscious adaptation of means to ends by virtue of acquired non-inherited knowledge and ways of thinking and acting." Compare, for instance, the construction of a cocoon by a caterpillar, or the first web-spinning of a spider, with the construction of a house, or the weaving of a net by a man. In the absolute absence of experience the caterpillar and the spider plainly act by virtue of inborn knowledge, and ways of thinking and acting, in other words, by instinct; the man, on the other hand, as plainly acts by virtue of acquired knowledge and ways of thinking and acting, in other words, by reason. In fact, so vast a part does the acquired factor play in all that is mental in man, that I have been unable to discover any action in him which is purely instinctive. Purely reflex actions he has in plenty, as, for instance, the movements of the various hollow viscera; but of the few instincts which survive in him (*e.g.*

parental and sexual love) none apparently are gratified without the aid of rational action. Consider, for instance, how greatly the instinctive appreciation of female beauty is modified by the acquired factor; there are savage tribes who mutilate, to render beautiful as they think, the faces of their women to a frightful degree. Consider, again, how much there is of the rational (*e.g.* the co-ordination of her muscles) in the mother's care of her offspring.

As in the case of physical characters, no systematic attempt has hitherto been made to differentiate between the mentally acquired and the inborn. As a result, much confusion and inaccurate thinking is manifest in writings, scientific and otherwise. I propose to deal with these to some extent presently; but first it would be interesting to trace, in however slight a manner, the evolution in animals of the power of acquiring mental traits. But, even before doing this, one other digression I may permit myself, since it has an important bearing on much that follows. It has been maintained that acquired characters, mental and physical, are transmissible. I will not here pause to consider whether such characters as I have ventured to denominate "enforced," nor whether such characters as result from the complete or partial reproduction of lost parts, are transmissible. The battle has been fought in countless publications, and I do not know that I have now anything very new or original to add, but I should like to say a little concerning the alleged transmissibility of such characters as result from use or experience, for instance, the acquired enlargement of the blacksmith's muscle through use, or the mental change evolved in the acquirement of a knowledge of mathematics through experience. Characters like these are held by a section of biologists to be transmissible, in part at least. But when a parent acquires such characters, they reappear in the child only in response to stimulation similar to that which caused them to arise in the parent. For instance, without such stimulation the child gets neither the enlarged muscles nor the knowledge of mathematics; in fact, he must in all cases acquire such characters afresh—from which it is

plain that that which is acquired by the parent does not become inborn in the child.

It may, however, be maintained by Neo-Lamarckians that stimulation causes not only the acquirement of a character, but increases also the power of acquiring it, and that it is this increase in the parent that is transmitted to the child, and which renders more easy the acquirement of the character by the latter. But there is no tittle of evidence showing that the stimulation which results in the acquirement of a character (mental or physical) causes also an increase in the power of acquiring it. The converse is in fact true: the infant's power of acquiring characters, mental and physical, is immense, and to it is mainly owing the development he undergoes in his passage from infancy to old age. But this power steadily declines in his long stimulated parts (mental and physical), till in the old man it is reduced to a minimum and tends to vanish. Clearly, then, as regards such characters as result from use and experience there can be no transmission to the child; therefore, as regards them, evolution must have proceeded wholly on lines of Natural Selection. Moreover, instincts (and such physical characters as are analogous to instincts, *i.e.* inborn physical parts) cannot have resulted from the transmitted effects of experience and use, since they do not increase under stimulation. There is, for instance, no reason to suppose that any instinct is sharpened by use, or, in other words, by experience. In fact, it would be a contradiction in terms to suppose that it is, since, if my definitions are right, all that is acquired pertains to reason, not to instinct. Moreover, did instincts increase under stimulation, and were this increase transmissible in however slight a degree, then instincts should be most developed in the highest animals and less in lower animals. The contrary, however, is the fact.

All acquired mental characters depend, of course, in the last analysis, on memory; and, therefore, an animal which is incapable of acquiring mental characters, and which, therefore, depends wholly on instinct, can have no recollection of past events, nor, as a consequence, any ideas concerning the future; it must live

entirely in the present. To this it may be objected, however, that various insects display an instinctive memory, and, for instance, return again and again with food to the nest where they have laid their eggs. If, however, my definitions are correct, these returns are not due to memory, but to an impulse (similar to that which causes them in the absence of experience to know a fit spot wherein to lay their eggs), which causes them again and again to return to this particular place, quite independently of any recollection of having been there before. It has even been denied that animals so high in the scale as fish possess a memory (the power of acquiring mental traits). The seat of memory has been held to be the cortex of the brain, and fish alone of all vertebrata have no cortex. I think, however, there can be no doubt that fish have some power of acquiring mental traits, since trout in a much-fished stream soon grow more wary. Indeed, memory may be detected in animals much lower than the fish. Even so low in the scale as the oyster is a rudimentary capacity for mental acquirement observable, for "even the headless oyster seems to profit by experience, for Dicquemase asserts that oysters taken from a depth never uncovered by the sea open their shells, lose the water within, and perish, but oysters taken from the same place and depth, if kept in reservoirs, where they are occasionally left uncovered for a short time and are otherwise incommoded, learn to keep their shells shut, and then live for a much longer time when taken out of the water."

As I have already said, speaking in general terms, the higher placed an animal is in the scale of life the greater is its power of acquiring mental characters, as will be apparent presently and as might have been expected; but it is also true that the higher species of a lower class or order often exhibit greater capacities for acquirement than the lower species of a higher class or order. It is even true that some invertebrates exhibit far greater mental receptivity than many vertebrates. Speaking again in general terms, the power of acquiring mental characters is only developed to a considerable extent in such animals as tend their young, and in them it is developed in proportion to the length of time

parental care is continued. Furthermore, it is developed to a very great extent only among such animals as not only tend their young for prolonged periods, but also lead gregarious lives. When animals, after laying their eggs, abandon them to chance, it is clear in cases where mind (*i.e.* consciousness and all that results from consciousness) plays a part in securing survival that such mind must be considerably developed from the moment of hatching. Hence it is that in such animals instinct greatly predominates. Moreover, they cannot acquire traits by imitation from their parents, and, therefore, whatever is acquired by the one generation is completely lost to the next; in other words, they have no traditional knowledge, and all that is mental in the individual is either inborn or has been discovered by himself. But when the animal, after birth, is protected for a prolonged period by its parent, it is clear that instinct (inborn knowledge and ways of thinking and acting) becomes less necessary for survival, since an opportunity is afforded of acquiring fit knowledge and ways of thinking and acting from the environment, particularly from the parent. It is then possible for knowledge to become traditional, and to be handed down from parent to offspring. When, in addition, such animals lead gregarious existences, the individual has the opportunity of acquiring mental characters, not only from the parent, but from other members of the community as well, and then complex mental acquirements have the best chance of being transmitted, instead of being lost. Under such circumstances the power of acquiring useful mental characters becomes a main factor in the struggle for existence, and those individuals who most possess it survive in the greatest numbers, and, therefore, concurrently with the growth of knowledge, occurs an evolution of the power of acquiring knowledge and a corresponding retrogression of instinct, which, in the ancestor, was a main factor of survival, but is now no longer so

I have given the dragon-fly as an example of an active animal which does not tend its young, and in which, therefore, instinct is developed to a high degree. The ant, on the other hand, is an animal which not only tends its young, but also lives in great

communities, and we have striking evidence that some species of ants, at least, and probably all of them, are actuated largely by knowledge and motives which are acquired, *i.e.* by reason, and not by inborn mental characters, by instinct. Thus enslaved ants captured as pupæ, and educated wholly by their captors, differ markedly from the free members of the species; they have other knowledge and ways of thinking and acting, and the fact that the slaves in their new homes so readily adapt themselves to the changed environment, so readily exhibit knowledge and ways of thinking and acting, which must be acquired, and cannot possibly be instinctive, for the reason that their ancestry can never have been subjected to the influence of a like environment, proves how great a share reason has in all that is mental in them. And since the slaves clearly acquire mental traits which fit them for their duties as servants, it is not unreasonable to suppose that the slave-holders, in like manner, individually acquire the mental traits which fit them for their functions as masters, *i.e.*, that in them the slave-holding habit is not instinctive, but rational. The lower vertebrata do not tend their young, which, therefore, are hatched highly endowed with instinct, but with very little power of acquiring mental characters. Reptiles, having better developed brains, have greater capacities for acquirement than fish; they can be trained to a much greater extent, can learn much more, and have been known to manifest affection for their masters, in which cases the acquired affection has been so strong as to overcome the instinctive dislike. Birds and mammals, like ants, tend their young, which, in proportion to the amount of protection accorded, are born helpless and devoid of instinct, but capable of mental acquirement. Ever as we rise upwards in the scale do we find this increasing protection associated with a growing helplessness at birth, and a steadily enlarged capacity for acquirement, which finds physical expression in a more and more developed brain, especially of the cerebral portion of it. A partridge at hatching, and a fawn at birth, are able to co-ordinate their muscles to a considerable extent, and have many other instincts. The parrot and the pup are very much more helpless, but their

capacity for acquirement is greater in proportion. Highest of all, the human infant is born absolutely helpless. It is unable to co-ordinate all but a very few groups of muscles; its instincts are reduced to a minimum; it cannot even seek the breast; but it is protected with prolonged and tender care, under which its vast powers of acquirement come into play.

Instincts, therefore, have undergone great retrogression in the higher types, but amid this general retrogression three instincts at least, have undergone evolution: (1) the parental instinct to protect the offspring; (2) the parental instinct to impart to the offspring the acquired knowledge which subserved the parents' survival; and (3) the instinct which impels the offspring to imitate the parent, and so acquire the physical and mental traits, the traditional knowledge and ways of thinking and acting, which the latter acquired. This subject is a very interesting one, but my space is limited, and therefore I will not dilate upon it, but content myself by instancing such familiar examples as the hen, the cat, and the human being in proof of my statements. Each of these animals teaches its young in different ways, and the instinct of the young causes it to imitate the parent, and sport in such a manner as to develop (*i.e.* favour the acquirement of) the physical and mental characters which conduce to the survival of the individual and the race. If it be doubted that animals lower than man have traditional knowledge, which is handed from generation to generation, I have only to instance the parrots of New Zealand, which have recently acquired the habit of sheep-eating, and the change which soon occurs in the demeanour of the higher animals towards man when he first enters a land where he was previously unknown, *e.g.* the Galapagos Islands. In such lands, lower animals (insects, for instance) if they exhibit alarm on his first appearance, show no increase of it in subsequent generations.

Some of this traditional knowledge, especially when it is of a kind greatly to favour survival, is doubtless of great antiquity. Of such a nature, if I am right in regarding it as an acquirement, must be the slave-making habit of certain ants, since their very

physical structure has been immensely modified by it, not by the congenital transmission of acquired characters, but wholly by the transmission and accumulation of such inborn variations as best serve the utilisation of the acquired character; hence, for instance, the great jaws of *F. rufescens*. In man occur many examples of physical structures modified by the persistent acquirement in generation after generation, during long ages, of particular acquired characters. For example, his whole digestive apparatus has been modified by his acquired habit of cooking or otherwise modifying his food, to which cause may even be attributed the unsoundness of the teeth of civilised man; these, since they are no longer absolutely essential to survival, having undergone retrogression as regards their power of resisting bacteria, etc. His lingual muscles have been modified by his acquired habit of speech. His slowly-acquired habit of bipedal progression has resulted in immense and obvious physical alteration. Even the acquirement of surgical knowledge, at first rudimentary, but now highly advanced, has caused at least one important modification. Animals, as a rule, bear their young easily. When any disproportion exists between the fœtal head and the maternal pelvis, both mother and offspring perish, and the peculiarity is not transmitted. Savage women are under much the same conditions, and give birth almost as easily as lower animals. But for ages civilised women in labour have received artificial aid; they are, therefore, nearly all incapacitated for a time after the birth of each child. Indeed, the recent advance in obstetric science has enabled so many of the otherwise unfit to survive among us for some generations past, that now numerous women are quite unable of parturition without instrumental aid.

The evolution of the power of acquiring characters, mental and physical, appears to me the most important, indeed the very central, fact in the evolution of all the higher animals. Beyond all other characters this has been steadily evolved by Natural Selection, and, therefore, the higher placed an animal is in the scale of life, the more is the power developed in him. Possibly some other mammals are as capable of acquiring physical char-

acters as man; it may be that much of the physical development they undergo after birth is due to the effects of use and exercise; but, beyond question, no other animal is mentally so receptive as man. His power of acquiring mental characters (*i.e.* his memory) is enormous, and so greatly does he depend on it for survival that, as we have seen, his inborn mental characters (*i.e.* his instincts), except in a few instances, have undergone complete retrogression. His mind, as I have said, is a blank at birth, and it follows, since so much is acquired, that the disposition and character of every man must be almost entirely acquired, and not inborn, as is usually assumed. Part of the contents of his memory are recognisable (*i.e.* may be distinctly remembered), but very much, especially all that is acquired during infancy, is not so. We speak of it as "forgotten," but forgotten things, though they can no longer be represented in consciousness, yet leave their impress on the mind. To take an illustration: imagine twin infants in the same cot, one awake and the other asleep; suppose an event happens that alarms the waking child, but leaves the other unaffected; suppose, again, that subsequently another event, observed by both children, occurs, which, owing to the apprehension and nervous irritability engendered by the previous event, again alarms the first child, and thus increases its irritability, but, because of its previously undisturbed equanimity, again leaves the second unaffected by fear; imagine this process repeated; then, though the original cause of fear were quite forgotten, the one child might well grow up of a much more timid and nervous disposition than the other; in which case every one would speak of the former as naturally (*i.e.* innately, instinctively) more timid than his brother, though, in fact, his access of timidity would be acquired.

In practice, owing to the necessity of the case, we act as if we realised that man's mind, his character, his disposition, is almost entirely acquired; and, therefore, every parent carefully trains his child for a prolonged period, striving, by precept and example, to inculcate fit mental traits, that is, fit knowledge and ways of thinking and acting. Even the savage mother does this,

and civilised nations have vast state establishments for educating their youth. Moreover, we realise that a child reared by the brave or the cowardly, the active or slothful, the moral or the immoral, the patriotic or the non-patriotic, the devout or the sceptical, and so forth, will generally exhibit the trait of his educators, even if they be not his progenitors. In fact, we realise, as regards man (though this is not true as regards such animals as the dragon-fly, in which, as we have seen, the mentally acquired is practically non-existent), that the mind of one generation imprints itself on the mind of the next, not racially, but educationally. But, in thinking of this or that adult man, or this or that race, we are apt to consider their mental peculiarities as innate. Especially is this done by men of learning, historians, anthropologists, psychologists, philosophers, and the like. It is not realised by them that man's *real mental evolution has lain in the evolution of his power of acquiring mental traits*, and that not in a single other inborn peculiarity does he mentally transcend lower animals, and, therefore, that one adult individual or race must differ from another individual or race wholly in the traits that are acquired, *and in the power of acquiring them.* For example, no man or race is born with greater musical, artistic, or mathematical powers than any other man or race, but merely with greater powers of acquiring them; for, in the absence of appropriate stimulation (*i.e.* experience, education), they do not develop even in the most "gifted." It seems probable, moreover, that powers of acquiring these and other particular faculties have not been separately and specially evolved by Natural Selection, but, on the contrary, that they are but particular manifestations of the general power of acquiring mental traits, which is what has been evolved by Natural Selection. Thus there appears to be no more reason for supposing that the mathematical faculty has been especially evolved than for supposing that the faculty for understanding the uses of machinery has been evolved; both the one and the other must have been equally useless to the primitive savage.

In lower animals the amount of mental receptivity is closely

associated with the size of the brain, the larger brain being the concomitant of greater receptivity, and, as a consequence, of lessened instinct. Associated with this truth is the fact that modern representatives of ancient animals (*e.g.* ungulates) have much larger brains than their ancestors, denoting the evolution in them of the supremely important faculty of acquiring mental characters. Now, since so little that is mental is inborn in man, while so much is acquired, we must conclude that differences in the sizes and shapes of the brains of different races imply, not inborn mental differences, but differences in the power of acquiring mental characters; and, therefore, for example, that the native Australian, with his small brain, differs from the Chinaman or Japanese, with his large brain, not mainly in that which is inborn, but mainly in that he has lesser power of acquiring complex mental characters. If this is true, and there is a mass of evidence proving that it is true, for children of one race reared by another and very different race develop the mental features of their educators, not of their progenitors (*e.g.* Europeans reared by savages, or savages reared by Europeans), then much of the reasoning of numerous thinkers has been founded on false premises, and is invalid. They have commonly estimated the mental calibre of a race by the intellectual feats performed by it, but plainly these are wrong criteria, since whether these feats be great or small depends almost entirely on the environment, that is, on education. A South Sea Islander, for instance, would, and could, do nothing in his ancestral environment compared to what he would be capable of intellectually were he during early life transferred to, and trained in the midst of, a learned and scientific society.

In discussing this subject, one is embarrassed by the wealth of the material that presents itself for criticism. In the lightest, as in the weightiest, literature, it is constantly assumed that various racial peculiarities and differences, which are manifestly acquired, are inborn; that this or that race is inherently brave, or resolute, or enterprising, or industrious, or gifted with a genius for colonisation or empire, while this or that other race is timid, or irresolute,

or indolent, or servile, and so forth. To illustrate my remarks and conclude my essay, I may cull a few examples from an enormous field. Mr Francis Galton says: "The importance to be attached to race is a question that deserves a far larger measure of exact investigation than it receives. We are exceedingly ignorant of the respective ranges of the natural and acquired faculties in different races; and there is too great a tendency among writers to dogmatise wildly about them, some grossly magnifying, others as greatly minimising, their several provinces. It seems, however, possible to answer this question unambiguously, difficult as it is." But, if I am right, as I think I am, in the foregoing, surely every writer has too greatly exalted the importance of the inborn, and too much minimised the importance of the acquired factor in man. Does not Mr Galton himself exalt vastly too much the importance of the inborn factor, as witness the following passage, which, in this respect, is similar to many others in his work:—

"The long period of the Dark Ages, under which Europe has lain, is due, I believe, in a very considerable degree, to the celibacy enjoined by religious orders on their votaries. Whenever a man or woman was possessed of a gentle nature that fitted him or her to deeds of charity, to meditation, to literature, or to art, the social condition of the time was such that they had no refuge elsewhere than in the bosom of the Church. But the Church chose to preach and exact celibacy. The consequence was that these gentle natures had no continuance, and thus, by a policy so singularly unwise and suicidal that I am hardly able to speak of it without impatience, the Church brutalised the breed of our forefathers. She acted precisely as if she aimed at selecting the rudest portion of the community to be, alone, the parents of future generations. She practised the arts which breeders would use, who aimed at creating ferocious, currish, and stupid natures. No wonder that club law prevailed for centuries over Europe; the wonder is that enough good remained in the veins of Europeans to enable their race to rise to its present very moderate level of natural morality." Mr Galton implies that a tendency to charity, meditation, or to the cultivation of literature, is an inborn and

transmissible character, whereas it is, in fact, acquired. A Quaker's child, for example, reared by North American or West African savages shows nothing of the gentle altruistic nature of his progenitors, and obviously shows no literary tendencies. The child of a bloodthirsty and immoral savage may be made sanctimonious to an even unpleasant degree, as has happened under the influence of missionaries in certain Polynesian islands, where, by act of the native legislature, flirtation is now a legal offence. The children of aborigines have done exceedingly well, as compared to Europeans, in the Australian Government schools. The Church, therefore, may have brutalised society in the Dark Ages by its influence on the characters acquired by the individuals comprising it; for instance, by inculcating celibacy, it may have prevented people who had the best characters from having families, and so passing on their acquired excellences, like language or even property, to descendants. But since mere chance, not innate tendencies, must have determined in each case the inclination or disinclination towards charity, etc., the Church cannot have selected any particular type, and therefore cannot have caused real evolution or retrogression.

It is, of course, impossible, for obvious reasons, to prove of a particular person with, for instance, charitable inclinations that in a different environment he would have acquired different inclinations. But what cannot be proved of the individual can be proved of the race, which is but an aggregate of individuals. If my definitions are correct, innate inclinations or tendencies are of the nature of instincts, and these can arise only very slowly under the prolonged action of Natural Selection, and, if they disappear, can do so only equally slowly after cessation of selection. But consider how rapidly a race (*e.g.* the Japanese) may change its characteristics. Consider, in particular, the enormous change, as expressed in the resultant civilisation, which occurs in the character of a race when it changes its religion. Compare the mental characters of the races of Asia Minor and North Africa as they changed successively from Pagan to Christian and from Christian to Mahomedan. Consider how much Pagan,

Mahomedan and Christian negroes differ in their mental characters. Consider how closely Mahomedans of all races resemble one another mentally. Consider how indistinguishable mentally are Catholic Teutons from Catholic Celts in Ireland, and how markedly they differ both from the Protestant Teutons and the Protestant Celts of Great Britain and Ireland. I have, however, dealt somewhat fully with this matter of religion elsewhere, and my space here is limited. Still I am in hopes that the little I have said proves that any tendency towards charity, etc., is wholly acquired and not inborn.

Again Galton says: "The ablest race of which history bears record is unquestionably the ancient Greek, partly because their masterpieces in the principal departments of intellectual activity are still unsurpassed, and in many respects are unequalled, and partly because the population that gave birth to the creators of these masterpieces was very small." He further says: "The average ability of the Athenian race is, on the lowest possible estimate, nearly two grades higher than our own—that is, about as much as our race is above that of the African Negro. This estimate, which may seem prodigious to some, is confirmed by the quick intelligence and high culture of the Athenian commonalty, before whom literary works were recited and works of art exhibited, of a far more severe character than could possibly be appreciated by the average of our race, the calibre of whose intellect is easily guaged by a glance at the contents of a railway bookstall." De Quatrefage says: "There can be no real relation between the dimensions of the cranial capacity and social development. . . . By such an extension the Troglodytes of the Cavern of Lq L'Homme-Mort would be superior to all the races enumerated in the table, including contemporary Parisians." But Mill wrote: "Of all vulgar modes of escaping from the consideration of the effect of social and moral influences on the mind, the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences"; and Buckle, the historian, who, notwithstanding the deficient knowledge of his time, had a true appreciation of the problem,

said: "Whatever, therefore, the moral and intellectual progress of men may be, it resolves itself, not into a progress of natural capacity, but into a progress, if I may say so, of opportunity, that is, an improvement in the circumstances under which that capacity after birth comes into play. Here again, then, lies the gist of the matter. The progress is one not of internal power, but of external advantage. The child born in a civilised land is not likely, as such, to be superior to one born among barbarians, and the difference which ensues between the acts of the two children will be caused, so far as we know, solely by the pressure of external circumstances, by which I mean the surrounding opinions, knowledge, associations, in a word, the entire atmosphere in which the two children are respectively nurtured."

Mill and Buckle, though unacquainted with the doctrine of evolution, were surely right. The ancient Greeks and Romans were certainly of extraordinary mental prowess, but it is more than probable that they surpassed our less remote ancestors only because the environment in which they lived was more favourable than the mediæval to the acquirement of fit mental traits; because, in their free, intellectual atmosphere, they were trained to the performance of intellectual feats, which were impossible to the fettered minds of our forefathers, who could hardly achieve greatness, except as priests or warriors, or as painters, sculptors, architects, musicians, or as other labourers in such arts as served the grandeur of the Church or the Throne. The splendour of the Greek and Roman achievements, therefore, does not constitute a proof that the Greeks and Romans were splendidly endowed, but only that the traits which they acquired from their progenitors enabled them to use their endowments splendidly. In judging of the mental capabilities of a people as a whole, as in judging of physical powers, it is safer to take as a test their corporal structures, their bodies and brains, rather than their mental and physical feats, for whether these latter be great or little depends on circumstances which may be favourable or the reverse. Had the Troglodytes received the same mental training as the Greeks, it is possible or probable, since their brains were large, that they

would have performed intellectual feats as great; but had Aristotle or Plato received the training of the cave-men, great feats would have been impossible to them. They would have died unknown to fame. Moreover, such feats as were performed by the Greeks would not have been recognised as great among prehistoric peoples, and such intellectual giants, but physical weaklings, of the modern world as Darwin and Spencer would have earned, and in that state of society deserved, the contempt of their fellows.

Mr Herbert Spencer attributes much of the contents of man's mind to the transmission and accumulation of acquired mental characters. Thus he attributes the altruistic feelings to this cause, and anticipates a happy future for man by their continued increase. Mr Benjamin Kidd—whom I confess I have a little difficulty in taking seriously—on the other hand, attributes these feelings to Natural Selection. He is very severe on Mr Herbert Spencer, and writes: "The confusion of ideas, to which the tendencies of the times give rise, finds remarkable expression in Mr Herbert Spencer's writings." The tendencies of the times seem to have confused Mr Kidd's own ideas to an even greater extent, and it would have been well had he hearkened to Mr Spencer's warnings against thinking in abstract terms.

As already indicated in this Journal, Natural Selection implies elimination of the unfittest, and Mr Kidd has failed to record a single death as due to the absence of this feeling in him who perished, and the presence of it in him who survived. Having regard to the foregoing, is it not abundantly evident that the altruistic feelings have not undergone evolution at all in man, neither by the transmission of inborn characters nor that of acquired characters? As I say, the child of a philanthropist, if reared by West African savages, might well be a fiend in cruelty, he certainly would have no philanthropic tendencies, as we understand them; the child of a cannibal, properly trained, might well develop into a philanthropist; and surely that which may be entirely lapsed or developed in a single generation cannot properly be regarded as a direct product of evolution. Like patriotism or devotion to a particular religious system, or a knowledge of

language or of letters, or of the uses of steam, or of the bicycle, the altruistic feelings are purely acquired (and not transmissible), and are not immediate products of evolution, but result indirectly from the evolution of man's mental receptivity, that is, from the evolution of his vast power of acquiring mental characters. Men in various times and places have been taught to worship sticks and stones, and to hold in reverence all kinds of absurd beliefs and notions; so also a child—any child—by fit training may be rendered highly altruistic—may be taught to receive and practise altruism, as he may be taught to receive and reverence fetishism; whence it follows, as a logical conclusion, that in every individual the altruistic feelings are purely acquired. It matters not that, in a greater or less degree, they are universal. So is knowledge of language and religion, which, though universal, is as much acquired as is knowledge of history or of astronomy. If, then, in the ancestry of man, these feelings were ever instinctive, as we may suppose them to be among bees, this instinct, like almost all others, was lapsed long ago, and was replaced by an acquired character. We need not wait, then, the slow evolution of the social millennium by the accumulation of inborn altruistic variations, as Mr Kidd expects, nor by the accumulation (and transmission) of acquired variations, as Mr Spencer expects. Were we all agreed as to the training of our children, it would be achievable in the very next generation, for surely, if a generation can be reared to reverence a stick or a stone, an inanimate idol, and this or that grotesque religious system, it can be reared also to love and reverence man.

One paragraph more and I am done. We hear of the evolution of morals or of language or of religion, of the printing press, of the locomotive, of the bicycle, and so forth. In the popular mind, and, I fear, even in the minds of some scientific men, this evolution ranks as a process of the same order as the evolution of an animal. Evolution means unfolding, and, therefore, the word is perhaps correctly applied to the bicycle, etc. But there is this essential difference between a living being and the bicycle. The former is the progeny of a parent; the

latter is not. So also the language of to-day is, in a figurative sense only, the progeny of the language of the former times; the morals of to-day have, in a figurative sense, only descended from those of yesterday. All these things are human inventions, and belong not to human evolution, but to what has been called evolution in the environment. The so-called "Social Evolution," of which we have lately heard so much, is therefore a myth, from the biological standpoint. As I have said, and as I wish to iterate and reiterate, neither the altruistic feelings in particular, nor morals in general, nor anything of the kind, has undergone volution in man. What has undergone evolution is his enormous power of acquiring characters, these among others.

APPENDIX E

A THEORY OF RETROGRESSION

It is widely believed that the development of the individual is a recapitulation of the life-history of the race. In other words, it is believed that every individual begins life as a unicellular animal, the germ, and then, in a very rapid and indistinct fashion, represents, in orderly succession, all its long line of ancestors, till in the end it represents its parent. This recapitulation is not more wonderful and mysterious than any other fact of biology. Imagine the primitive world, in which only unicellular organisms were present. Suppose that variations occurred amongst these, just as we know they occur higher in the scale. Then we may well believe that such variations as the following occurred: that, when one cell divided into two, the resulting cells did not separate, as normally happened, but remained adherent. This variation, which, like other variations, would tend to be transmitted, and which, if fortunate, would tend to cause the ultimate survival of the organisms which possessed it, would be the first step in the evolution of the multicellular from the unicellular organism. The dual animal which resulted would reproduce by each of its cells dividing into two, so that there would be four single cells, which would separate so as again to form unicellular organisms. But each unicellular organism would, in general, inherit the peculiarities and repeat the life-histories of its grandparent cells by dividing into two adherent cells. A race of two-celled organisms would thus be established. We may fairly believe that in time a second variation, which also proved fortunate, occurred, whereby the four granddaughter cells also remained adherent until reproduction, and afterwards other variations of the like nature, till an organism was at length evolved

which consisted of a multitude of cells adherent for the common benefit. When this organism reproduced, it would be by one or more of its cells separating, and dividing into two adherent cells, these into four, and so on, till the parent organism was represented. Ontogeny would thus necessarily recapitulate phylogeny. This rule would still obtain when evolution proceeded farther, and cells had become differentiated and specialised for the performance of different functions. Every individual would still begin as a single cell, the germ, and then, step by step, would represent ancestor after ancestor, till at last he represented the last of the race, the parent. The above view of heredity is necessary to my argument, and apparently is opposed to other and more modern theories which at present seem to hold the field—for instance, Weismann's theory of Germinal Selection, or Mr Francis Galton's theory that so much of an individual is derived from this ancestor, so much from that, and so much more from a third. Every one of these latter theories ignores what seems to me the patent fact that the characters of all the ancestors are not commingled in the final result, the adult, but that during ontogeny each ancestor is represented in turn. It is true that, watching the development of an individual, we cannot say that at such and such a point the great-grandparent ends and the grandparent begins; that at this other point the grandparent ends, and behold—the parent. The changes are too complex and subtle, too swift and fleeting; moreover, at every turn the variations from his ancestry of the individual under observation strike in and add to the apparent confusion.

It may be objected that the child during his development does not represent exactly, nor even closely, any of his remote ancestors, and this objection would appear fatal to the above theory of heredity. On the other hand, any sufficient explanation of this vagueness of representation will go far to establish, not only this theory, but also that theory of retrogression which is the subject of this article, and which, if it be a true theory, is, in a humble way, the complement of the theory of evolution.

Offspring, as we know, vary from their parents, and, if they

vary, they must do so primarily in one of two ways: Either they must revert to the ancestral type, and resemble it more than the parent did, or else they must diverge from it still more than did the parent. The former variation we term "atavistic," the latter we may term "evolutionary," since it is on the lines of these latter variations that evolution proceeds. But of so-called atavistic variations there are also two kinds, one of which is really atavistic and reversionary, whereas the other, though apparently atavistic, is actually evolutionary. True reversion occurs only when the individual varies so from his parent that, in his development, he does not recapitulate the whole of the life-history of his race, but stops short at a point reached by a more or less remote ancestor, whom in this way he resembles more than he does his parent. False atavism occurs when the individual, at an early stage of his existence, begins by recapitulating the whole of the life-history of his race up to his parent, but during a later stage retraces, or apparently retraces, some of the last steps made by himself in his development and by the race in its evolution, and thus, by a species of evolutionary variation, resembles a more or less remote ancestor more than he does the parent. Examples of this false kind of atavism are plentiful in nature.

The points here set forth are these: First, that development is a recapitulation of evolution; in other words, that every individual repeats, though very rapidly and indistinctly, the life-history of his race, beginning with the unicellular organism and ending with the parent. Secondly, that an individual may so vary from his parent that he does not recapitulate the whole of the phylogeny, and that this constitutes true atavism, true reversion. Thirdly, that there is a false atavism, which is really evolutionary. This occurs when an individual, after reaching the full development of his parent, retraces some of the last steps of the ontogeny, and so resembles an ancestor more than he does his parent. More need not be said concerning the first proposition. As regards the third, it has been said above that examples of false atavism are frequent. From the nature of the case observation of it is difficult, for in every individual this retracement of the ontogeny, this false

atavism, must be very slight—so slight as usually to be inappreciable. Therefore it is only by observing the retracement, not in an individual, but in a line of individuals, that it becomes plainly noticeable. It is by taking advantage of such retracement that "Reversed Selection," as it has been termed, eliminates a structure, which a change of environment has rendered not only useless, but worse than useless, more rapidly than would otherwise occur under the mere absence of selection. For example, Natural Selection has resulted in the evolution of eyes. In animals dwelling in absolute darkness, *e.g.* certain cave-dwellers, the eye has become not only useless, but worse than useless, since it is an extremely prominent and tender, and therefore vulnerable, part of the organism. In some such animals we observe that the eye is better developed in the embryo than in the adult. Clearly here the animal in its ontogeny retraces some of the steps it has already made. Clearly, also, if ontogeny be a recapitulation of phylogeny, such retracement was made in the phylogeny as well. It follows that when a structure, useless both to the embryo and the adult, is better represented in the former than in the latter, it must have undergone retrogression through the action of Reversed Selection, and that during the phylogeny, after being useful, it became not only useless, but worse than useless.

The second proposition, that an individual may so vary from his parent as not to recapitulate the later stages of the phylogeny, and that this constitutes atavism, is the main proposition of the present thesis; but I have yet to prove that this atavism is the cause of true retrogression.

True atavism can seldom be observed in such of the higher animals and plants as have been evolved under Natural Selection, not because it does not occur, but simply because it is usually masked and slight. It is masked, because such complex beings seldom or never retrogress in all their characters at once, and, therefore, such reversion as may occur in this or that particular, is associated with evolutionary variation in other particulars. It is slight because, since such species have evolved but slowly, reversion to a not very remote ancestor does not result in any

appreciable change of type. Thus, under ordinary circumstances, if a man reverted to any particular ancestor of a thousand years ago, no one would recognise to what the change of type was due. Not only would the change be too slight, but the observer would need to have a knowledge of the ancestral form, and such knowledge is usually impossible. Sometimes, however, recognisable reversion does occur even among such beings. Thus a man may resemble the portrait of some far-away ancestor; or, again, the progeny of an ordinary pair of horses may exhibit the zebra-like stripes of a remote ancestor. It is not, however, among complex beings, slowly evolved in every particular, that we must seek our proofs. We must turn to plants and animals that have undergone swift evolution in some one particular, and this, so far as I know, occurs only under stringent Artificial Selection. For Natural Selection, having care for many characters, results in but slow evolution,—but Artificial Selection, having care for one or only a few characters, results in much swifter evolution. Supposing, then, we take any breed of domesticated animals or cultivated plants, and, after choosing the finest specimens, henceforward breed indiscriminately from these and their descendants, what then happens? It is notorious that under such circumstances cessation of selection is marked by a reversion towards the ancestral type—a reversion swift in proportion to the swiftness of the antecedent evolution. Thus, without continued stringent selection the speed of race-horses cannot be maintained; they tend to lose their special characters, and revert to the ordinary horse. The same is true of all other prize breeds. Again, careful breeding from ordinary horses readily evolves a speedier race; for the offspring of ordinary horses, in many instances, surpass the parents. But, in proportion to the success of the breeder, further improvement grows continually more and more difficult, till, at length, evolution practically reaches a standstill. Improvement thereafter is very slow indeed. For this reason it is now very difficult to improve our breed of race-horses. The offspring of a pair of the finest animals are, in the great majority of cases, inferior to their parents, and, therefore, practically all that the

most stringent selection is now able to achieve is to preserve, not to improve, the race. It is therefore plain that, owing to the increasing tendency towards reversion, rapid evolution rapidly slows down, till, even in the presence of stringent selection, it practically ceases.

But perhaps the most striking proofs of the present theory are furnished by certain cultivated plants (for instance, the apple), which are usually propagated by means of slips and suckers—that is, by detached portions of the individual. Practically speaking, the most favourable individual of a species has been chosen and multiplied by means of slips, the rest of the species being eliminated; and in each new seminal generation the process has been repeated. Such plants, therefore, have been evolved by a tremendously severe process of selection, resulting in an evolution much more rapid than is possible among animals or annual plants. But now, supposing we chose any one of these highly divergent varieties, and, without using any selection, bred from seed alone, what again would happen? There is ample evidence leading us to believe that, in the vast majority of instances, the variety would swiftly (that is, in a very few generations) revert to something very like the wild stock from which it originally descended,—but not to the wild stock precisely, for, no doubt, while the cultivated species was undergoing evolution in one direction, it was, under the changed conditions, undergoing retrogression in other particulars, and in these the reverted varieties would differ from the wild stock.

I need not dwell longer on the tendency such plants and animals have towards retrogression. The facts are notorious. But it seems to me that these facts are strongly adverse to all those recent theories of heredity to which I have alluded, and which suppose that each ancestor is not represented in turn during the ontogeny, but that the characters of all or many of the ancestors are commingled or latent in the final result, the adult—Weismann's theory of germinal selection, for instance, or Mr Galton's theory, which supposes that, on the average, one-half of the total heritage of an individual is derived from the parents, one-

quarter from the grandparents, one-eighth from the great-grandparents, and so on. Were such theories true, there could be no retrogression except through reversed selection, for the more evolved ancestors would forever tend to make their influence felt. But, plainly, retrogression occurs in the mere absence of selection. Moreover, if it be true that the organic world has arisen through the preservation and accentuation of favourable variations, and if it also be true that ontogeny is a recapitulation of phylogeny, then it seems to me that it must be further true that there is necessarily a greater tendency towards retrogression than towards evolution. For all atavistic variations must tend towards retrogression; whereas all evolutionary variations need not constitute extensions of the previous evolution. They may result in divergencies in new directions, or may even constitute reversals of the previous evolution, as in those cases of which Reverse Selection takes advantage. Given sufficient time, in the absence of selection, retrogression must therefore necessarily ensue.

The rationale of retrogression, I take it, is as follows:—Suppose, as regards any character which has undergone evolution, that A, B, C, D represent a line of individuals; then if D reverts to B—that is if D varies from his parent C in such a way that in his ontogeny he represents the life-history of the race only up to the point reached by B, omitting the additional characteristics of C—it is evident, from the point of view of heredity, that the series becomes A, B, D, or, rather, it becomes A, B, since, in effect, D is B. C then disappears completely and forever from the series, and it follows that, if the characters of C ever reappear in E, or any subsequent member of the series, they must do so as a result of fresh evolution, not as a result of reversion. It is necessary to emphasise this point, for on it my whole argument depends. If D, on the other hand, varies in such a manner from C that, *after* representing C, that is, *after* recapitulating the whole of the phylogeny, he reverts back to B, then C does not disappear from the series. C will still be represented in the ontogeny, and, if his characteristics reappear in any individual at the end of the ontogeny, that is in the adult, it will be as a result, not of

evolution, but of reversion. As I have already indicated, it is on such cases as the latter that Reversed Selection works. Thus, when during the phylogeny any character becomes useless, and selection ceases, retrogression eliminates it with a speed which is proportionate to the speed of evolution. But, if it becomes *worse* than useless, then an additional factor steps in to hasten elimination. Reversed Selection then takes advantage of such apparently atavistic, but really evolutionary, variations as cause an individual, after he has represented his parent, to revert back again to a remoter ancestor. Moreover, Reversed Selection not only preserves such individuals, but also eliminates all such individuals as have the worse than useless characters in a greater degree than their parent, and thus prevents them from influencing posterity.

It would be well to illustrate the foregoing with a concrete case. Suppose we plant seeds of those garden plants which I have instanced as having undergone very swift evolution. In a great number of cases the young plants revert towards the ancestral wild type. Now, I have enquired elsewhere, and I have never heard that the seeds of such a reverted plant, or of any of its descendants, have ever reproduced the cultivated type. This means that the cultivated type has disappeared absolutely from the series. It will never again be represented in the ontogeny, and could reappear only as a consequence of fresh evolution, resulting from selection as stringent as that by which the cultivated type was originally evolved; if it did reappear without fresh evolution, it would be because the reversion to the wild type had resulted, not from true atavism, not from a lapsing of the last steps of the ontogeny, but from the false atavism on which Reversed Selection works. But, since the retracement on which Reversed Selection works is apparently always small in amount, it never seems to occur in species that have been so rapidly evolved as these garden plants. Their reversion, therefore, seems to be invariably due to true atavism, there being apparently no room for Reversed Selection. Here, then, is a strong proof, convincing proof, as it seems to me, that true atavism means a lapsing for good and all of the last steps made in the phylogeny.

Two things are evident from the foregoing. First, that there is on the average a greater tendency towards reversion than towards evolution, that is, there is a greater tendency to revert towards the ancestry than away from it, in other words, there is a greater tendency to let lapse in the ontogeny the last steps made in the phylogeny than to add other steps to them. Secondly, the strength of the tendency towards reversion is proportionate to the swiftness of the antecedent evolution, and, therefore, species which have been quickly evolved, tend to retrogress swiftly, whereas species which have been slowly evolved tend to retrogress slowly. For this reason it is that characters long established in the species are much more stable than more recent characters, for, in the former case, reversion, to be appreciable, must be to an extremely remote ancestor, whereas in the latter, reversion to a much less remote ancestor results in appreciable retrogression.

Suppose now a certain character in a line of individuals has undergone evolution. Denote by the symbols A, B, C, D, E, F, the evolution of the character in successive individuals of the line, A being the rudimentary character as it appeared in the first of the line who had it, F the character when it reached its highest perfection. Suppose that cessation of selection occurs as regards this character. Then F tends to be lapsed, and, when it is lapsed, E reappears at the end of the ontogeny. But thereafter E also tends to be lapsed, and D to reappear, and so on, till, in the continued absence of selection, at length A reappears. But, under the same law, A tends likewise to disappear, and then the character vanishes utterly, and the race reverts to that ancestral condition when the character did not exist. In this manner, I take it, useless parts disappear absolutely. Thus have disappeared, for instance, the limbs of the snake. Thus have disappeared the eyes of some cave-dwelling animals, and the many useless parts of parasites. Thus have vanished innumerable useless parts in every plant and animal.

We are now in a position to consider the part played by reversion in nature. Every complex individual, as we know, varies in a thousand ways, great and small, from its parent, but

only here and there is a variation useful. The useful variations, in proportion to their usefulness, are preserved, and, in succeeding generations, are accentuated by Natural Selection. The useless variation, the vast majority, are planed away by reversion. Most of them being minute, disappear in the next generation, but, even when they are comparatively great, a very few generations suffice to procure their disappearance. Even should a series of individuals happen to vary in such a manner that, in each successive individual, a useless character is more and more accentuated, yet, since the tendency towards atavism is greater than towards evolution, a time surely comes when, perhaps in a single generation, the whole of the evolutionary variations lapse, and the character vanishes, never to reappear, except in the improbable event of fresh evolution of a like nature. Again, it sometimes happens that a change of environment renders useless a structure which was formerly useful. Here also reversion steps in and procures its elimination. Such a structure—say the wing of a bird, the habits of which have ceased to be aerial—was evolved by the superimposition in a long line of individuals of favourable variation on favourable variation. These, when the character becomes useless, are lapsed in orderly succession, the most recent first, the more ancient later; till, at last, the structure reverts to that most ancient condition when it did not exist. In this manner it approximates continually to more and more ancient forms, but only approximates. It never reproduces its prototypes of the phylogeny exactly, for, during the whole course of evolution, reversion was at work, planing away everything which was originally useless, or which became useless as the environment changed. A complex organ such as a wing is, therefore, a product not only of evolution, but also of reversion. Evolution rough-hews the organ, but reversion chisels its finer lines. What is true of a complex organ is true in a yet greater degree of every complex plant and animal. Such a being is a product not only of evolution, but also of reversion. In it many structures useful during a remote period of the phylogeny, but useless later, have disappeared utterly by reversion to the yet more ancient condition

when they had not come into existence. Others, in which reversion is yet incomplete, still persist, and are known to us as vestigial remains. It should, however, be noted that, when a vestigial structure is more developed earlier in the ontogeny than it is later, this indicates that its retrogression is due not only to reversion, the result of true atavism, but also to false reversion, the result of reversed selection. Such a structure must have become not only useless, but worse than useless, during the phylogeny.

Every complex animal, therefore, in the successive stages of its development does not represent exactly successive stages in the evolution of its race. At each stage of the ontogeny are present useless structures, which have retrogressed backwards towards a more ancient order of things; and at every stage of the ontogeny structures are absent, which were present in the phylogeny because they were useful, but which since underwent complete retrogression, because they subsequently became useless. Here, then, we have the explanation of the fact that ontogeny is only a very vague recapitulation of the phylogeny. Doubtless, if a high animal, a man for instance, lived during his ontogeny in a succession of environments similar to those in which his race was evolved, his ontogeny would more exactly recapitulate the phylogeny than it actually does, for, in that case, structures, which had been useful during the phylogeny, would continue to be so during the ontogeny, and so would be preserved. But consider how vastly different is the environment in which the embryo of man develops, from the environments in which his race evolved. The embryo develops in the uterus, but its free prototypes struggled each for itself in a world full of enemies, full of eliminating agencies. How many parts, therefore, have become useless to the embryo, which were useful to the prototypes. How vast is the field in which retrogression has worked. Is it any wonder, then, that the ontogeny of man is only a vague recapitulation of his phylogeny. Reversion, then, is the necessary complement of evolution, and without it there could be no evolution, except of the simplest kind. Without reversion there

could be no planing away of the numberless useless variations which occur during, and especially at the end of, the ontogeny, nor of all those structures which, though useful during some part of the phylogeny, became useless later. Without reversion, therefore, a species would soon become so burdened with useless variations and structures as to be incapable of existence. Reversed Selection could not cause the elimination of all these useless and burdensome characters; for no matter how burdensome, and, therefore, worse than useless, they are in the aggregate, separately they are so little burdensome that Reversed Selection could not act. It could not act on them in the aggregate, for this would mean that in some individuals they would be present *en masse*, whereas they would be absent *en masse* in others; and this, we know, is not the case. Moreover, Reversed Selection causes a retracement, not a lapsing of characters. It therefore works at a double disadvantage as compared with ordinary Natural Selection, and, as a consequence, can effect comparatively little. No extensive examples of such retracement are, in fact, known to us in Nature. Again, without retrogression, the recapitulation of the phylogeny in the ontogeny would be impossible, and, for this reason once again, evolution would be impossible. For, were there no retrogression, the prototypes of the phylogeny would necessarily be reproduced exactly in the ontogeny, and then the latter would be as elaborate, and almost as lengthy as regards time, as the former. Moreover, the prototypes of the phylogeny could not exist in the enormously changed environment of the ontogeny. How, for instance, could a gill-breathing animal, or any of the higher forms which intervene between them and man, exist in the uterus, in which alone can exist those dim representations of the phylogeny that constitute man's ontogeny?

It is this great change of environment, this close protection of the individual in the uterus and afterwards, which has rendered possible the evolution of man and the other higher animals. Opportunity has thus been afforded to retrogression to plane away innumerable characters which had become useless. The ontogeny

has thereby been straightened, shortened, and simplified, and the evolution of new characters, useful in the new environment, has become possible. Thus, for instance, has been rendered possible the higher characters of man, for even after birth he is closely protected, and, therefore, even in that portion of the ontogeny which intervenes between the infant and the adult has there been much retrogression. Consider how feeble and helpless is the infant after birth; but its prototypes of the phylogeny fought for their own existences. The infant can digest scarcely anything but milk, and its jaws are very feeble. Its prototype must have had much wider powers of digestion. Perhaps more remarkable than anything else is the retrogression of instinct in man. I have dealt at length with this question elsewhere, and have not space for it here; but consider how helpless is the infant at birth, how extremely incapable, as compared to young insects, for instance, of adapting itself, of its own initiative, to the environment. Later on it acquires all kinds of knowledge and ways of thinking and acting, which serve as superior substitutes for instinct. But meanwhile the mother's protection, which has rendered possible this acquirement, has rendered useless also the instincts of its prototypes, which have therefore been lapsed. Hence the retrogression of instinct in man. By it his mental ontogeny is shortened and simplified, just as by the retrogression of bodily parts his physical ontogeny is shortened.

In the foregoing I have spoken of characters lapsing in orderly succession, the last first, the earlier later. But it seems to me probable that earlier characters may sometimes lapse before the later. This may happen when some parts of the phylogeny, and consequently of the ontogeny, are not direct, but form a loop, so to speak. The omission of the loop would straighten, and therefore shorten, the ontogeny, and considering how condensed is the latter, I believe that this must often occur.

APPENDIX F

Of the lineal descendants of one Ada Jurke, a pauper, born in 1740, and who died from alcoholism in 1800, 7 were convicted of assassination and punished accordingly, 76 others were convicted of minor crimes of all grades, 144 were mendicants by profession, 64 others were cared for by various public charities, and, finally, 181 were prostitutes. The sum total spent by the Government on the maintenance, surveillance, prosecutions, etc., of the members of the family amounted to over six millions of francs (about £1,150,000)

APPENDIX G

It has been asserted that parental drunkenness tends to cause "nervous instability"—whatever that may mean; these vague terms are the bane of science—in the child which, in turn, leads to epilepsy, insanity, and what not. Now if this be true, then alcohol weeds out the unfit much more rapidly than I supposed, and my contention is greatly strengthened. But truth compels me to admit that I have seen no real evidence bearing on this point. Statistics without end I have seen, but the old confusiou between *post hoc* and *propter hoc* is ever perpetrated. If it be argued that inebriates very frequently have offspring insane or epileptic, I must reply, so have non-inebriates. If it be argued that inebriates have a higher proportion of offspring so afflicted, I must retort that it is precisely from those who have a tendency to insanity or epilepsy that one would expect inebriety, and that though this tendency might not find expression in the parent, and may result only in drunkenness, yet it is to it, and not to the parental inebriety, that the filial epilepsy or insanity is probably due. Moreover, in these statistics no attempt has been made to differentiate between the effect of alcohol on the germ and its effect on the embryo and the fœtus. Doubtless this is impossible, for mothers drunken before pregnancy are usually drunken during it, and often the fathers are drunken also. Still, unless it be done, the statistics are inconclusive. No one doubts that alcohol is a poison. Very probably it does in many cases injure the developing brain of the child, with the result that subsequently epilepsy or insanity may supervene. It injures the mother's nervous structures we know, and there is no apparent reason why it should not injure the child's. But this is one thing; it is not a problem of heredity. The effect on the germ of the alcohol circulating in the parent's

blood is another thing. That, indeed, is a problem of heredity. If alcohol does so affect the germ that the child is mentally abnormal, then here we have a variation, not a modification, as when the fœtus is affected. Variations tend to be transmitted, and therefore a race that used alcohol would on that hypothesis become more and more insane and epileptic till it became extinct. I am not aware that South Europeans have become so insane and epileptic as to be threatened with extinction. We must remember that there are no nervous tissues in the germ.[1]

[1] Extract from Article by the Author, *Lancet*, 14th October 1899.

APPENDIX H

"As regards the drink traffic, no one seems inclined to speak the truth about it in West Africa, and what I say I must be understood to say only about West Africa, because I do not like to form opinions without having had opportunities for personal observation, and the only part of Africa I have had these opportunities in has been from Sierra Leone to Angola; and the reports from South Africa show that an entirely different, and a most unhealthy, state of affairs exists there from its invasion by mixed European nationalities with individuals of a low type greedy for wealth. West African conditions are no more like South African conditions than they are like Indian. The missionary party, on the whole, have gravely exaggerated both the evil and the extent of the liquor traffic in West Africa. I make an exception in favour of the late Superintendent of the Wesleyan Mission on the Gold Coast, the Rev. Dennis Kemp, who had enough courage and truth in him to stand up at a public meeting in Liverpool, on 2nd July 1896, and record it as his opinion that, "the natives of the Gold Coast were remarkably abstemious; but spirits were," he believed, "of no benefit to the natives, and they would be better without them." I have quoted the whole of the remark, as it is never fair to quote half of what a man says on any subject, but I do not agree with the latter half of it, and the Gold Coast natives are not any more abstemious, if so much so, as other tribes of the Coast. I have elsewhere attempted to show that the drink traffic is by no means the most important factor in the Mission failure on the West Coast, but that it has been used in an unjustifiable way by the missionary party, because they know that the cry against alcohol is at present a popular one in

England, and it has also the advantage of making the subscribers at home regard the African as an innocent creature who is led away by bad white men, and, therefore, still more interesting and more worthy, and in need of more subscriptions than ever. I should rather like to see the African lady or gentleman who could be "led away"; all the leading away I have seen on the Coast has been the other way about.

"I do not say that every missionary who makes untrue statements on this subject is an original liar; he is usually only following his leaders and repeating their observations without going into the evidence around him; and the missionary public in England and Scotland are largely to blame for their perpetual thirst for thrilling details of the amount of baptisms and experiences among the people they pay other people to risk their lives to convert, or for thrilling details of the difficulties these said emissaries have to contend with. As for the general public who swallow the statements, I think they are prone, from the evidence of the evils they see round them directly rising from drink, to accept as true—without bothering themselves with calm investigation—statements of a like effect regarding other people. I have no hesitation in saying that in the whole of West Africa, in one week, there is not one-quarter the amount of drunkenness you can see any Saturday night you choose in a couple of hours in the Vauxhall Road; and you will not find in a whole year's investigation on the Coast, one-seventieth part of the evil, degradation, and premature decay you can see any afternoon you choose to take a walk in the more densely populated parts of any of our own towns. I own the whole affair is no business of mine, for I have no financial interest in the liquor traffic whatsoever. But I hate preying upon emotional sympathy by misrepresentation, and I grieve to see thousands of pounds wasted that are bitterly needed by our own cold, starving poor. I do not regard the money as wasted because it goes to the African, but because such an immense percentage of it does no good and much harm to him.

"It is customary to refer to the spirit sent out to West Africa

as 'poisonous,' and as raw alcohol. It is neither. I give an analysis of a bottle of Van Hoytima's trade-gin, which I obtained to satisfy my own curiosity on the point:—

"ANALYSIS OF SAMPLE OF TRADE-GIN.

"With reference to the bottle of the above, I have the honour to report as follows:—

"It contains

	Per cent.
Absolute alcohol,	39·35
Acidity expressed as acetic acid,	0.0068
Ethers expressed as acetic acid,	0.021
Aldehydes,	Present in small quantity.
Furfural,	Ditto.
Higher alcohols,	Ditto.

"The only alcohol that can be estimated quantitatively is ethyl alcohol.

"There is no methyl, and the higher alcohols, as shown by Savalie's method, only exist in traces. The spirit is flavoured by more than one essential oil, and apparently oil of juniper is one of these oils.

"The liquid contains no sugar, and leaves but a small extract.

"In my opinion, the liquid essentially consists of a pure distilled spirit, flavoured with essential oils.

"Of course, no attempt to identify these oils in the quantity sent, viz., 632 cc. (one bottle), was made. The ethers are returned as ethyl acetate, but from fractional distillation amyl acetate was found to be present.—I have the honour to be, &c.,

"G. H. ROBERTSON,
"*Fellow of the Chemical Society*,
"*Associate of the Institute of Chemistry*."

"In a subsequent letter Mr Robertson observed that he had been assisted in making the above analysis by an expert in the chemistry of alcohols, who said that the present sample differed in no material particulars from, and was neither more nor less deleterious to health than, gin purchased in different parts of London

and submitted to analysis."—("Travels in West Africa," by Mary H. Kingsley, pp. 492-5. London: Macmillan & Co.)

"About the same time, as far as I can remember, I was invited to speak at a meeting of the Good Templars of the town of Cape Coast. One of my native colleagues also gave a temperance address. I shall not soon forget the earnestness with which he exhorted his hearers to fight the gigantic demon strong drink. 'For,' he said, 'unless we put forth our best efforts in this direction, there is a danger of becoming as drunken as the people of England.' This was rather a startling way of putting the case, but it was decidedly refreshing, as I remembered there were so many in England who appear to be under the impression that whole territories are being depopulated by the importation of spirits.

"The sentiment expressed by my colleague was forceful, but I unhesitatingly repeat and endorse it. Long before this period I had formed a Band of Hope in connection with our day-school, so as to lend a hand in preventing the rising generation from becoming 'as drunken as the people of England.' It should be a comfort to friends of Africa to know that the evils of the drink traffic are much less serious at the Gold Coast than appears to be the case in some parts of the Dark Continent. Concerning the Gold Coast and the drink traffic, I am thankful to be able to say: (First) That the drink traffic does not tend to poverty. This may be due to the fact that poverty is entirely unknown in that highly favoured land. (Second) That it does not bring in its train the untold social misery with which we are so sadly familiar in this country; but then, of course, the conditions of social life are totally different. (Third) That it does not tend to the perpetration of crime. A friend of mine, a most ardent temperance reformer, was appointed District Commissioner of Cape Coast a few months prior to my first year's residence. At the end of his first term of service he took the opportunity to write to a temperance paper in this country to say that the friends of temperance would be glad to know that the ravages of the drink traffic were not as serious at the Gold Coast as was generally supposed. Out of the

hundreds of cases tried at his court during the twelve months, not one was traceable to the abuse of strong drink."—("Nine Years at the Gold Coast," by the Rev. D. Kemp.)

"It is a mistake to suppose that intoxication was unknown among the natives of West Africa until the merchant gave them gin and rum, or that the work of the missionary has been baffled by the sale of these liquors. My experience is, and I have seen the native far inland and at places at the coast where contact with the Europeans is frequent, that there is very little drunkenness among them, certainly nothing to be compared with that to be met with in the towns and villages of Christian England, and that when intoxication occurs, it is as often the result of drinking palm wine as of gin or other imported liquor."—("The Siege of Kumassi," by Lady Hodgson.)

APPENDIX I

"THE relative intoxicating power of wine and beer has recently been discussed in the public press, and *Truth* committed itself to the opinion that it takes more beer than wine to make a man drunk, and that if the sale of spirits were prohibited in England there would be very little drunkenness. Clearly an important point in settling this question is the degree of dilution of the alcohol, whether with soda water or with a diffusion of hop. In this relation the following figures, adapted from the *Allgemaine Zeitung* for 19th July, may be of interest. They show the consumption of wine, beer, and whisky per head, in pints, for Europe and America during 1898. They give also an estimate of the equivalent in pure alcohol for each of the beverages. The strongest beer contains about 9 per cent. of alcohol, and the weakest about 2 per cent.; therefore the average ratio is taken as 5·5 per cent. Sherry contains about 27 per cent. of alcohol,

while champagne and the Rhine wines contain about 7 per cent.; the average is therefore taken as 17 per cent. Whisky contains about between 50 and 60 per cent. of alcohol; its average is therefore taken at 55 per cent.

YEARLY CONSUMPTION *PER CAPITA*.

	Wine in Pints.	Alcohol, Equivalent in oz.	Beer in Pints.	Alcohol, Equivalent in oz.	Whisky in Pints.	Alcohol, Equivalent in oz.	Total oz. of Alcohol.
Great Britain,	3¼	11	253½	278	8	88	377
Germany,	6	20	215	247½	14½	159½	427
France,	19½	66	43½	48	16½	181½	295½
Russia,			7	8	8½	93½	
Switzerland,	11½	39	116½	128	10½	115½	282½
Netherlands,					14	154	
Norway,			37½	41	4½	49½	
Sweden,					14	154	
Denmark,			165	181½	26	286	
Belgium,			362	398	15	165	
United States,	1¾	6	103	113	7	77	196

From this it will be seen that if in Great Britain the sale of spirits were prohibited, less than 25 per cent. alone of the immediate cause of drunkenness would thereby be abolished; or, in other words, our hypothetical man would have to drink about eighty extra pints only of beer in the year to achieve the same toxic result—that is, less than two additional pints in each week. In regard to alcoholic strength, a pint of beer is equivalent to about three wineglassfuls of wine and one wineglassful of whisky. So, if a man takes a wineglassful of whisky and mixes it with eighteen ounces of soda water, he is drinking beer for all intoxicating purposes. It may be taken as an axiom, except for the lightest German beer, that the limit of drunkenness is, for the average man, well within his power of imbibing fluid. The limit of

drunkenness is, however, a personal equation. But if a man be not temperately inclined, he ingests alcoholic fluid until the desired effect is produced, and, even if he be so inclined, the standard of his temperance is often guaged at a little less than his power of resisting the toxic effect of the alcohol element. But for the real toper, be it on beer, whisky, or wine, the goal of intoxication is eventually reached; and even were spirits abolished, as our contemporary suggests, the goal would still be reached on the principle of the old wayside sign, "Drunk for a penny, dead drunk for twopence." While giving our contemporary every credit for desiring abstract temperance, it seems that a theory according to which any man would rarely be drunk if limited to wine and beer is not without risk. It is practically certain that not many men in England will get *delirium tremens* during the first year of the new century from drinking champagne, but we should be devoutly thankful if the man in the street would drink less beer than he did during the last year of the old century." (*British Medical Journal*, p. 1733, 15th December 1900).

APPENDIX J

PRACTICALLY the only means of judging of the prevalence of venereal disease in the United Kingdom is by comparing the annual reports of the Director-General of the Army Medical Department. The reports from the Navy are less reliable, since the naval population is a very fluctuating one—fluctuating that is between home and foreign ports, as well as between different home ports. The reports of the Registrar-General of Deaths are totally unreliable. As in the case of Alcoholism, deaths from venereal disease are thought to be disgraceful, and the medical attendant usually certifies to "marasmus" or "apoplexy," etc., not to the venereal disease from which arose the immediate cause of death. Moreover, many deaths remotely due to venereal disease cannot be traced with any certainty to it by the medical attendant. Thus if a man dies of apoplexy, for example, it is generally difficult to ascertain whether the apoplexy was, or was not, due to syphilis. The Army Medical reports prove that venereal disease is steadily diminishing year by year. The disease rate was falling before the Contagious Diseases Acts were imposed, it fell markedly during their action, it rose slightly after their repeal, but has since fallen. The morality of the country, however, cannot be said to be improved. As already stated, few young men are continent before marriage, and very many young men even now contract one or other form of venereal disease. The decrease is due simply to the spread of medical knowledge. Men now know better than formerly how to avoid venereal disease, and, when they contract it, their doctors know better how to cure it.

The fall of the disease rates before the Acts were imposed, and after their repeal, has been claimed by those opposed to legislation as a proof that the diminishing rate during the operation

of the Acts was not due to their influence, but was merely part of a general process which began before and was continued after. If this be stated of the country at large, it is undoubtedly true; the Acts affected only an infinitesimal proportion of the population. If it be stated of the Army as a whole, it is to some extent true; the Acts were very imperfect, and, as in the case of the general population, affected only a portion of the Army. But if, as has often been done, on this he founded a further statement that the Acts failed to diminish disease in the places where they were applied, then the statement is simply a falsehood. The following is a report of the Army Medical Department, issued May 1878. It will be observed that the stations brought under the Acts were the larger, and that before the Acts came into operation disease was more prevalent in them than in those not brought under the Acts.

TABLE showing the number of Men always in Hospital with Primary Venereal Sores at twenty-eight Stations, for Troops in the United Kingdom, in each year, from 1870 *to* 1877, *inclusive.*

YEAR.	UNDER THE ACT.			NOT UNDER THE ACT.		
	Average Annual Strength.	Constantly in Hospital with Primary Venereal Sores.	Ratio per 1,000 of the Strength.	Average Annual Strength.	Constantly in Hospital with Primary Venereal Sores.	Ratio per 1,000 of the Strength.
1870 . .	41,580	186	4.46	17,852	174	9.74
1871 . .	54,096	210	3.89	19,957	161	8.07
1872 . .	50,794	232	4.56	19,950	225	11.29
1873 . .	48,039	214	4.45	19,801	195	8.86
1874 . .	48,136	150	3.11	18,879	130	6.89
1875 . .	48,606	129	2.66	19,573	115	5.88
1876 . .	48,620	120	2.47	18,790	112	5.94
1877 . .	52,422	137	2.61	19,076	119	6.23
Total, . .	392,293	1,378	...	153,878	1,211	...
Average for 8 years.	49,037	172	3.51	19,235	151	7.85

The following table illustrates the fact that, during the full operation of the Acts, more than double the number of cases per thousand of troops were permanently in hospital suffering from "primarily venereal sores," in the non-protected stations than the protected stations.

TABLES RELATING TO THE CONTAGIOUS DISEASES ACTS, AS REGARDS THE ARMY, CONTRASTING THE RESULTS AT TWENTY-EIGHT LARGE STATIONS IN THE UNITED KINGDOM, BEING ALL AT WHICH THE FORCE WAS 500 MEN AND UPWARDS, WHEN THE FIRST ACT WAS APPLIED.

Tables showing the admission into Hospital for Primary Venereal Sores and for Gonorrhœa at twenty-eight Stations of Troops in the United Kingdom from 1860.

YEAR.	THE FOURTEEN STATIONS SUCCESSIVELY BROUGHT UNDER THE ACTS.					FOURTEEN LARGE STATIONS NOT UNDER THE ACTS.				
	Average Annual Strength.	Admissions into Hospital for Primary Venereal Sores.	Admissions into Hospital from Gonorrhœa.	Ratio per 1,000 of the Strength.		Average Annual Strength.	Admissions into Hospital for Primary Venereal Sores.	Admissions into Hospital from Gonorrhœa.	Ratio per 1,000 of the Strength.	
				Primary Venereal Sores.	Gonorrhœa.				Primary Venereal Sores.	Gonorrhœa.
1860 . .	57,479	8,405	7,966	146	139	17,118	2,292	2,374	134	139
1861 . .	51,328	7,267	7,133	142	139	17,126	2,049	2,023	120	118
1862 . .	45,322	5,314	6,283	117	139	15,026	1,500	2,070	100	138
1863 . . .	43,419	4,653	5,202	107	120	15,132	1,612	1,816	107	120
Totals for 4 years.	197,548	25,639	26,584	...	...	64,402	7,453	8,283	...	...
Average for 1860-63	49,387	6,410	6,646	130	135	16,100	1,863	2,071	116	129

1864 . . .	40,692	4,135	4,803	102	118	14,894	1,647	1,636	111	110
1865 . . .	43,078	4,077	4,937	95	115	14,091	1,418	1,968	101	140
1866 . . .	39,476	3,444	4,573	87	116	14,595	1,154	1,663	79	114
1867 . . .	39,911	3,640	5,274	91	132	20,589	2,372	2,670	115	130
1868 . . .	42,595	3,533	5,685	83	133	19,486	2,130	2,236	109	115
1869 . . .	42,017	2,765	4,466	66	106	17,739	2,273	1,856	128	105
Totals for 6 years.	247,771	21,594	29,738	...	...	101,394	10,994	12,029	...	...
Average for 1864-69	41,295	3,599	4,955	87	120	16,899	1,832	2,005	108	119
1870 . . .	41,580	2,268	4,081	55	98	17,852	2,022	1,723	113	96
1871 . . .	54,096	2,763	6,254	51	116	19,957	1,865	2,137	93	107
1872 . . .	50,794	2,752	5,280	54	104	19,950	2,457	2,113	123	106
1873 . . .	48,039	2,420	3,946	50	82	19,801	2,025	1,888	102	95
1874 . . .	48,136	2,039	2,968	42	62	18,879	1,661	1,450	88	77
1875 . . .	48,606	1,717	2,825	35	58	19,573	1,552	1,405	79	72
1876 . . .	48,620	1,622	3,302	33	68	18,790	1,554	1,677	82	89
1877 . . .	52,422	1,809	3,581	35	68	19,076	1,730	2,234	91	117
Totals for 8 years.	392,293	17,390	32,237	...	...	153,878	14,866	14,627	...	...
Average for 1870-77	49,037	2,174	4,037	44	82	19,235	1,859	1,828	97	95

N.B.—For the years 1860-66 inclusive, Windsor has been omitted from the group of Stations under the Act, and London from that not under the Act, as the returns for those years do not afford the necessary information.

APPENDIX K

"AMONG the papers referred to this Commission by Your Majesty's Government, and which we print in the Appendix, is a memorial to the Secretary of State, 'Adopted at a conference of delegates from associations and committees formed in various towns for promoting the repeal of the Contagious Diseases Act,' and signed F. W. Newman, chairman. We do not propose to criticise this paper at length, nor should we have thought it fair to notice it at all, as representing the views of the opponents of the Acts, had it come before us under less respectable credentials. The memorial reads more like a vindication of the Rights of Prostitution, than a grave argument against the Acts on moral and political grounds. Prostitutes, it is urged, 'value their personal liberty as highly as other women do,' and to shut up a diseased street-walker in a hospital until she is cured, would be 'to change the whole structure and arrangement of her life; the relations which she had formed would be abruptly ended; milliners, dressmakers, sempstresses, domestic servants, etc., who eke out a precarious existence, or provide themselves with coveted luxuries in the form of dress, etc., by recourse to occasional prostitution, would at once lose their business connections, or if in situations, would be discharged.' One of the best apologies for these Acts, if they need apology, consists in the fact that they deter the class of women referred to in the above-quoted paragraph from resorting to prostitution to 'provide themselves with coveted luxuries,' or even 'to eke out a precarious existence.' The rest of this paper consists mostly of frivolous objections to the machinery of the Acts."—("Report, Royal Commission Contagious Diseases, 1871," paragraph 44).

APPENDIX L

"AMONG the means adopted by some of the opponents of the Acts to bring them into public odium have been charges of misconduct or gross negligence on the part of the police, in putting the law in force against common prostitutes. Cases have been brought forward in publications and speeches at public meetings, not only of cruel insults to innocent women through the agency of the Acts, but of repeated wrongs to the unhappy women who have been, or are, subjected to them. We have made inquiry into every case in which names and details were given. We have requested the persons who have publicly made these statements to substantiate them. In some instances the persons thus challenged have refused to come forward; in others, the explanations have been hearsay, or more or less frivolous. The result of our inquiries has been to satisfy us that the police are not chargeable with any abuse of their authority, and that they have hitherto discharged a novel and difficult duty with moderation and caution. Even if it had been proved that in some instances they made mistakes or exceeded their duty, such errors might have rendered it necessary to make provision for the more careful administration of the Acts, but would have been no valid argument for their repeal. The charges thus rashly made and repeated, have contributed much to excite public indignation against these enactments."—("Report, Royal Commission Contagious Diseases, 1871," paragraph 23).

APPENDIX M

REPORT OF THE RESEARCH COMMITTEE APPOINTED BY THE SOCIETY FOR THE STUDY OF INEBRIETY.

At the Quarterly Meeting of the Society for the Study of Inebriety, held on 13th July 1899, a resolution was passed by the members to constitute a special Committee to consider the relation of Heredity to Inebriety. The Council of the Society met on 12th October 1899, and approved of this resolution; and a special Committee, consisting of the new President, Dr Wynn Westcott, Dr Thomas Morton, Dr Archdall Reid, Dr Harry Campbell, Dr Heyward Smith, Professor Victor Horsley, Professor Sims Woodhead, Dr Laing Gordon, Dr Lauzen Brown, Mr Henry Rayner, Mr William Francis Hazel, Mr William Henry Kesteven, Surgeon-Major Poole, and Dr Aydon Smith, the Honorary Secretary, was appointed, with power to add to their number—"To investigate the conditions under which the tendency to inebriety is capable of transmission to offspring." The first meeting was fixed for 13th November 1899, and Dr Harry Campbell courteously offered the use of his house at 23 Wimpole Street.

The Committee has held twenty-one meetings.

Professor Victor Horsley and Dr Henry Rayner have been unable to take part in the work. Dr Lauzen Brown has been obliged to leave the country for medical duties in Africa. Dr A. E. J. Longhurst and Dr William Charles Sullivan were added to the Committee.

The last meeting of the Committee was held on 7th February 1901, when the annexed Report was approved by nine members, some of whom, however, have added comments on certain points

upon which they dissented from the terms of the Report. These comments are printed after the clauses of the Report. Mr Kesteven supplies a separate Report. Dr Longhurst, Dr Sullivan, and Surgeon-Major Poole were unable to sign the Report.

Dr Thomas Morton has kindly acted as Secretary to the Committee, and is especially thanked for his services; Dr Harry Campbell is also thanked for his kindness in lending his house for the meetings of the Committee.

Dr Wynn Westcott was appointed Chairman of the Heredity Committee, and he presents the accompanying Report and opinions to the Council of the Society.

At a meeting of the Council, held on 16th April 1901, this Report was received and adopted, and ordered to be printed and circulated among the Members and Associates.

REPORT OF THE COMMITTEE UPON THE HEREDITY OF INEBRIETY.

I. The genesis of inebriety in the individual depends on three essential factors, of which one is inborn and the others acquired. —*Dr Thomas Morton declining to sign.*

II. The inborn factor is a capacity for enjoying the sensations evoked by indulgence in alcohol. Without it men would not drink, for they would not enjoy drinking.—*Dr Thomas Morton declining to sign.*

III. The acquired factors are:—(*a*) A personal experience of the sensations evoked by alcohol. Without this acquired knowledge, this memory, no man would crave for the sensations in the sense the inebriate craves. (*b*) The increased delight in drink which continued indulgence in drink confers. It is an essential factor, for, in Europeans at any rate, a single experience of drink rarely gives rise to a craving for it.—*Dr Thomas Morton declining to sign.*

IV. The inborn capacity for enjoying alcohol, like other inborn traits, is certainly heritable, and for this reason, among others, it is that one drunken generation succeeds another.

V. On the other hand, there is no evidence that acquired characters are heritable.

VI. In particular, there is no evidence that characters acquired by the parent through indulgence in drink are inherited by the children subsequently born. The Committee are aware that it is possible that the mental and physical states produced in the parent by indulgence in alcohol do affect the child in some way through inheritance; again they admit as possible, though strictly speaking this is no question of the inheritance of an acquirement, that indulgence may so damage the parental tissues that the germ is ill-nourished, and the child is thus affected; yet again, they admit as possible that the alcohol circulating in the parent's blood may directly affect the germ, and in this manner affect the offspring, as by producing degeneracy. But these speculations have not been strongly supported by any evidence tendered to the Committee.

VII. Just as men differ in size, in strength, in colour, and in every other peculiarity, so they differ in their capacity for enjoying alcohol, some men delighting greatly in it and some men little.

VIII. Men differ also in their capacity for resisting the temptation to drink to excess, some men giving way more, and some less, to the temptation to indulge. — *See comments of Dr Archdall Reid and Dr Laing Gordon.*

IX. As a rule men drink in proportion to their desires, balanced, however, by each man's degree of self-control, and by the environment in which he is placed; in other words, men who greatly enjoy alcohol drink, as a rule, deeper than men who enjoy it less. As a consequence, deep and habitual drinkers are almost invariably those to whom alcohol brings much enjoyment (either as positive pleasure or as cessation of pain); whereas the great bulk of temperate persons are those to whom it brings comparatively little or even no enjoyment. The Committee recognise that there are numerous exceptions, for men are

influenced by moral, religious, and other considerations. Yet the fact remains that he who is greatly tempted more often falls than he who is less tempted.

X. Alcohol is a poison, as is abundantly proved by common experience and the statistics of Temperance, Friendly, and Insurance Societies. These prove conclusively that, as a class, drinkers have shorter lives than abstainers, and afford a presumption that they also leave fewer descendants.

XI. Alcohol, like every other toxic agent, has most effect on those who are most exposed to its influence. In other words, it continually weeds out from every race exposed to it the individuals who most enjoy and indulge in it.

XII. Races that have long been exposed to the action of alcohol have grown more and more temperate. For example, Greeks, Italians, South Frenchmen and Germans, Spaniards, Portuguese, and Jews, who have been most exposed to the action of alcohol, are very temperate. The nations of Northern Europe, on the other hand, who have been less exposed to the action of alcohol—for example, the British, Scandinavian, and Russian—are more drunken; whereas most savages, Esquimaux, Red Indians, Pacific Islanders, Tierra del Fuegians, Australians, and others who have had little or no racial experience of alcohol are excessively drunken. West Africans form an exception to the drunkenness of savages; they are comparatively temperate, but they have been long weeded out by alcohol in the shape of abundant supplies of palm wine.—*Dr Thomas Morton declining to sign, and see comments of Dr Wynn Westcott and Professor Sims Woodhead.*

XIII. It must, however, be recognised that national differences are not wholly dependent on this age-to-age elimination. Much must be allowed for national differences in temperament, independent of this factor of elimination, and for ideals of enjoyment, for differences in the kind of intoxicant used, for social and industrial conditions, and for the want of self-control in savage races.—*Dr Archdall Reid and Dr Laing Gordon dissenting.*

XIV. It follows that the inborn tendency to inebriety is heritable, and that the trait is most marked in races that have had little or no experience of the poison. Apparently the trait arose in man quite apart from the use of alcohol, since races that have had no experience of alcohol or any other narcotic are the most drunken of all when afforded the opportunity. Setting aside all *a priori* considerations, and judging solely by available evidence, the Committee are of the opinion that the continued use, or rather abuse, of alcohol tends to render a race less innately prone to excessive indulgence than it would otherwise have been, and that this result is brought about by the elimination of those with a strong tendency to alcoholic indulgence, and the survival of those with a weak tendency to alcoholic indulgence. They are aware of, and have devoted full consideration to, the widespread belief that parental indulgence tends to render offspring more innately prone than they otherwise would have been to excessive indulgence, but they can only reiterate their conviction, that the existing evidence on the subject does not at present warrant such a conclusion.—*See Professor Sims Woodhead's and Dr T. Morton's comments.*

XV. The offspring of women intemperate during their pregnancies are not included in the foregoing conclusions. There is some evidence that fœtuses and embryos are injured by maternal inebriety; but here again the Committee has no conclusive evidence that this injury takes such a form that in subsequent life the children have a special predisposition to inebriety.

Signed by—

WILLIAM WYNN WESTCOTT, *Chairman.*
HARRY CAMPBELL.
LAING GORDON.
WILLIAM FRANCIS HAZELL.
G. ARCHDALL REID.
AYDON SMITH.
HEYWOOD SMITH.
SIMS WOODHEAD.
THOMAS MORTON, *Honorary Secretary.*

COMMENTS OF THOSE WHO DISSENT FROM CERTAIN PARTS OF THE REPORT.

Comments by Professor SIMS WOODHEAD.

As one of the Committee, I sign the Report as a whole, because we have agreed to send out a statement which may prove of service in drawing attention to the inebriety question. As to sections 12 and 14, I cannot say that I am satisfied with the evidence that has been brought forward in support of them. I think, however, that they ought to stand, as embodying the opinions of certain members of the Committee, and that even those of us who do not sign these sections are of opinion that the theses (or rather the thesis) embodied form a basis for further research; but I think for the present they are only open to academic discussion, and that they only touch a small part of the whole question. SIMS WOODHEAD, *Cambridge.*

Comments by Dr LONGHURST.

1. Too bald and abstract a statement without evidence in support of it.

2. The taste for drink, not necessarily inborn, may be acquired.

3. Increased desire for, not delight in, drink.

4. The inborn capacity for enjoying alcohol is occasionally heritable, but not always so.

5. In my opinion, evidence does exist that acquired characters are heritable, as is stated by Virchow and others.

6. If no actual or experimental evidence is available, family experience in successive generations supports belief that acquired

characters of parents are inherited by the children subsequently born.

7. Accepted.

8. Accepted.

9. Accepted.

10. Accepted.

11. Accepted.

12. Simply because the drunken die out.

13. Accepted.

14. Yes, the inborn tendency to inebriety is heritable, but I cannot accept the statement of the Report that the trait is most marked in races that have had little or no experience of the poison, which statement is unsupported by any evidence of proof.

15. Yes, I agree that fœtuses and embryos are injured by maternal inebriety, and think it highly probable that the injury may produce in such a special predisposition to inebriety, though evidence of it may be wanting.

I return the Report herewith, with the above comments, and, as I was not present at the earlier sittings of the Committee, I feel that I cannot honestly sign the Report.

A. E. T. LONGHURST.

Comments by Surgeon-Major POOLE.

1. I deny that there is any individual genesis of inebriety.

2. This paragraph then falls to the ground in consequence of my denial of No. 1.

3. This I agree to.

4. There is no proof of this. One drunken generation succeeds another on account of the education in inebriety given to their offspring by drunken parents. The evidence of non-heredity appears to me just as strong as the evidence of heredity, for we

constantly see the offspring of drunkards perfectly temperate, especially if they have been brought up in an atmosphere of total abstinence.

11. I deny that deep habitual drinkers get much enjoyment from the excessive use of alcohol, and would rather incline to the opinion that really so-called temperate people do often enjoy its use.

12. I consider this assertion unwarranted either by evidence or recognised experience, and this paragraph should not be inserted. Races to whom alcohol has been introduced without knowing the consequences of indulgence in the same, and recognising its effects as those of exhilaration and, to a certain extent, pleasurable, take to its use, and then to its excessive use, until they perceive the injury it is doing to their race and people, and then they learn the better way, leave it off, and so become temperate. It seems to me that, unfortunately, no nations have been more exposed to the use and abuse of alcohol than the British, to say nothing of the Scandinavian or Russian, and yet its use is increasing more and more, among the British at least, with the direst results.

14. Seeing that I deny the inborn tendency to inebriety, it follows that I deny its heredity; races which have no experience of alcohol are, *per se*, not the most drunken. There is no evidence to prove that they are. Their acquired habit of drinking is the result of the continual and continued pouring into their midst of liquors with the most potent inebriating qualities.

I approve of the latter half of this paragraph on the whole.

GEO. K. POOLE, M.D.,
Surgeon-Major, H.M.I.S.

Comments by Dr LAING GORDON.

8. I cannot agree that "the capacity for resisting temptation to drink to excess" is of any importance in relation to heredity, seeing that, "as a rule, men drink in proportion to their desires" (*see* 9); surely it is the rule that man exercises his will to satisfy, and not to oppose, his desires.

12. While convinced of the truth of this important clause, I am of opinion that the Committee might have made research, with advantage, to ascertain for itself further facts bearing upon this subject.

13. This is a vague clause, and assumes much while proving nothing. There is no proof that nations are temperate *as nations* from any other cause than the survival of those with the least capacity for enjoying the sensations produced by indulgence in alcoholic drinks.

I think that the meaning of some of the clauses might be made clearer by a revision of the construction.

H. LAING GORDON.

Comments by Dr ARCHDALL REID.

The Report is true in the main, but it contains some clauses which rob the truth of its clearness and emphasis. As a result, the Report is defective, both as a statement of fact and as a literary production, and to that extent will fail to carry conviction.

At the end of paragraph VI. it is stated that the view that parental drinking injures the child was not strongly "supported by any evidence tendered to the Committee." By that it is implied that some evidence was tendered. As a fact, none was tendered which I could accept; there was nothing to indicate that the usual confusion between *post* and *propter hoc* had not once again occurred. On the other hand, overwhelming evidence was

tendered that parental drunkenness does not injuriously affect the germs. Germinal changes are transmissible to remote descendants. If alcohol injuriously affected the germs, the effects would accumulate generation after generation till the race became extinct; no instance of such racial deterioration is discoverable.

Paragraph VIII. is true by itself, but false when taken with the context. Read with the context, it implies that resolute men with a desire for alcohol use, as a rule, their will power to control, not to gratify, their desires. The question is begged. The opening lines of the next paragraph absolutely contradict the statement.

Paragraph XIII. is intended to tone down paragraph XII. Partly true when taken by itself, it is quite untrue when taken with the context. Moreover, the terms in which it is couched are deplorably lacking in scientific precision. No evidence was tendered to the Committee in support of any of its contentions. A question is begged in every line of it. The kinds of temperaments which render races sober, or the reverse, are not specified, nor are the races affected by them indicated. It is evidently assumed that the effects of temperament increase the contrast between the sober and the drunken races, but no proof was offered. What is meant by "ideals of enjoyment," and what their effects on the different races are supposed to be, is left to the imagination. As a fact, the main thesis of the Report is that races differ with respect to their capacities for enjoying alcoholic indulgence. Thus, North Europeans are so constituted that they enjoy intemperance more than South Europeans. Of necessity their temperament and ideals of enjoyment are thereby rendered different. So much is clear; but something more than this is hinted at in the passage under consideration—hinted at, but not clearly specified.

Again, no evidence was produced that the kind of intoxicant used makes any difference in the sobriety of the race. It is plainly intended to hint that the more dilute solutions make for sobriety. But savages who are unable to manufacture alcohol, or can manufacture it in very dilute solutions only, are extremely

drunken when given the opportunity. The English who consume three-quarters of their alcohol as beer, and less than one-quarter as spirits, are less temperate than South Europeans, whose wine, on the average, is more than twice as strong as beer.

Lastly, it is hinted that savages are drunken because they lack self-control—an unproved and unprovable assumption. Savages are drunk because they are intensely tempted by alcohol. Most of us are sober, not because we exercise great self-control, but simply because we lack the great craving that savages have. If the contrary were true, we, who have constant opportunities for indulgence, should each of us be tormented by a continual craving to get drunk. I am sure that is not the case with most of us. If, instead of thinking in the abstract terms of the paragraph, we examine concrete cases, it will be found that national differences with respect to drinking depend almost wholly on elimination. When there are concomitant circumstances they will be found to minimise, not to accentuate, the differences. Thus the dear alcohol and the vigorous temperance propaganda in Great Britain minimise the difference between the British and the South Europeans, who have cheap alcohol and no temperance propaganda. Again, in Great Britain, temperance is a much desired and sought-for ideal. In the South of Europe it is not, since it is a fact accomplished without effort. People no longer strive for that which they have already attained.

The Committee had a clear and unmistakable message of high importance to give. It had discovered that certain popular beliefs were mere superstitions. It is a thousand pities that it has failed in some respects to deliver its message clearly and emphatically. The Report should have been founded solely on verifiable evidence; some of it is altogether against the weight of evidence.

G. ARCHDALL REID.

Comments by Dr WYNN WESTCOTT.

Clause XIV. The opening statement of this Clause is true as far as my study of the subject enables me to judge. The Committee has adopted the remarks on national peculiarities on the authority of the researches of Dr Archdall Reid, and has itself not made any investigations on this subject. The comparative sobriety of different races and nations at different ages is hardly capable of any definite proof, although correct inferences may possibly be drawn from literary sources.

WYNN WESTCOTT.

Comments by Dr THOMAS MORTON.

Although I do not like the form which either the proceedings of the Committee or their outcome have taken, I sign the Report with some reservations, because I agree generally with its two contentions (IV., V., and VI.), that the inebriate constitution, in so far as it is an acquired character, cannot be transmitted to offspring, but only in so far as it is an inborn character; and that (X. and XI.) elimination of families most prone to inebriety must have been, as it certainly is, constantly going on, whatever may be the value of the facts alleged in Clause XII., as to which I desire to be considered as offering no opinion.

I believe all men (VII.) are more or less potential inebriates, which is only another way of expressing the facts that all men are more or less led by the desire of pleasurable sensations, and that alcohol, among—and supreme among—certain other drugs, is so marvellously related to the human body as to be capable not only of exciting certain sensations in an exquisite degree, but of establishing a morbid condition in which they are more and more craved for.

This potential inebriety varies within wide limits, and what is inherited in the case of those who have it most strongly is not a simple supernormal capacity for delighting in alcohol or other narcotic drugs, but something very much more complex, which may be briefly described as a constitution in which the balance between this capacity and the power of self-control in the face of temptation is disturbed, either by excess of the one or the defect of the other, or possibly both, and in which a morbid crave is easily set up.

And although I do not believe that the life led by an inebriate parent can increase the one (VI.), I go far beyond the grudging admissions of the Report in thinking it quite probable it may diminish the other, and cause a morbid crave to be easily set up.

From this point of view the investigations of the effects of chronic alcoholism and other more or less parallel poisonings in conducing to degeneracy in offspring, to which the Committee were continually invited by a valued member, would have come well within the scope of the enquiry, and I greatly regret that the Committee did not see its way to collect information upon, and seriously investigate, the question of degeneracy from parental alcoholism, which is entirely ignored in Section XIV.

Maternal alcoholism (XV.) of course affects the developing child directly through the circulation, apart from true inheritance. It is therefore properly treated apart in the Report, and I hope care will be taken to keep it apart in subsequent investigations, but I think its effects might have been much more unreservedly admitted.

The Report may be taken for what it is worth as an expression of the opinions of a small body of men who have given their attention to the subject, but I am painfully conscious that, although it may correct some popular misapprehensions, it does not advance in any degree the little exact knowledge of the subject which we possess.

T. MORTON, M.D.

The Separate Report of Mr KESTEVEN.

I cannot sign the Report, as it does not express my views. The following statement reproduces the information which I have gathered from the discussions of the Committee, or have found confirmed thereby. I have cut it down as much as I can with perspicuity. W. HENRY KESTEVEN.

I. Inebriety is a form or variety of morbid deficiency of the power of self-control, which shows itself in the unrestrained or inefficiently controlled indulgence in a craving for the sensation of well-being caused by the use of alcohol, or such like drugs.

II. This morbid deficiency of the power of self-control may be inborn, that is, hereditarily transmitted, or it may be acquired by the individual.

III. The craving for the sensations of well-being, in other words, for the gratification of the animal sensations, is inborn in the race.

IV. The use of alcohol, or any other drug, is always an acquired habit.

V. Excessive use of alcohol results, in the individual, in the poisoning of all the tissues of his body, whether those tissues be somatic or germinal.

VI. Such toxic action impairs the nutrition metabolism of the somatic tissues, producing degenerative changes, and taints and diminishes the vitality of the germinal tissues.[1]

[1] The proof of the fact asserted in the last sentence is found, first, in the fact that the germinal matter is part of the parental body; secondly, is supplied with nutrition by the same means as the other tissues; and thirdly, its protoplasm is subject to the same intoxication as that of the somatic tissues. This fact is also shown in lead poisoning. No one will dispute that alcohol will act as a poison, and produce definite degenerative changes in the metabolism and structure of the organs of the body that are actively engaged in the

VII. This lesion of the vitality of the germinal tissue shows itself in the offspring developing therefrom, by affecting those nervous elements which are the latest products of evolution, and, therefore, the least stable, which also constitute the physical basis of the higher mental operations.

VIII. This affection of the nervous elements consists of an impaired vitality, and, therefore, retarded development, with enfeebled performance of the functions of these tissues.

IX. This condition may manifest itself, first, in arrested development (idiocy); second, in greater irritability or proneness to discharge (epilepsy); or, thirdly, in a diminution from the average mental power of self-control.

X. It is under this latter manifestation that the tendency to inebriety is met with.

XI. If in addition to the racial inborn tendency to indulge the animal cravings (*N.B.*—Not a tendency to inebriety but to the general condition) there be, in the parent, an inborn morbid deficiency of the power of self-control, and if this is manifested by inebriety, the offspring of such parent will be more prone to

vital processes, *e.g.* the liver, the kidneys, the heart, and the nervous system. In the tissues not so actively concerned in metabolic changes, as, for example, the germinal cells of the testes and ovaries, the effect of such intoxication takes place in structural changes, from the nature of the case utterly impossible to demonstrate, or in impairment of vitality, or that form of motion which is the property of protoplasm, which can only be seen in the effects produced in future development, evidence of which is to be met with in the prisons, in the asylums, and in the hospitals.

Scientific evidence which will positively connect alcoholic poisoning and the effect here asserted to make its appearance in the offspring, cannot be produced, from the impossibility of distinguishing between the effect of alcoholic impairment and that produced by other causes; but from the analogy of its action on other organs and tissues, it seems unwise to conclude that it has no such action on the germinal tissues, especially in the face of the almost universally held opinion which has grown up from individual experience.

exhibit such inborn instability than when this parental deficiency is not present, in consequence of the injury to the germinal matter from which the said offspring was developed. That is, if the lesion does not produce the more organic changes which are seen in idiocy and epilepsy.

XII. That this proneness to instability will take the form of inebriety in the offspring does not follow, as the use of alcohol has to be acquired. But should that form of animal gratification outbalance others, inebriety is liable to reappear.

W. Henry Kesteven.

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